DOCUMENT RESUME

ED 316 395 SE 051 197

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TITLE	Meaningful Mathematics, Level Five. Recording Forms and Worksheets for Pupil Use.
SPONS AGENCY	National Science Foundation, Washington, D.C.
PUB DATE	89
GRANT	MDR-8550460
NOTE	173p.; All documents in this series (see SE 051 187-199) done with dot matrix printer and printed on colored paper. SE 051 196 is the Teacher's Guide and Lesson Plans for Level Five.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Elementary Education; *Elementary School Mathematics; *Grade 5; *Home Instruction; *Mathematical Concepts; Mathematical Vocabulary; Mathematics; Mathematics Curriculum; Mathematics Education; Mathematics Instruction; *Mathematics Materials; *Worksheets

ABSTRACT

Mathematics and the use of mathematical thinking should be much more than what has been traditional school arithmetic. Much of the mathematical reasoning can be developed and experienced out of school, particularly in the home. This material contains recording forms and worksheets for activities for the Level Five experiences. Pupils are to complete these as part of their learning experiences. Forms and worksheets are included for all of the concepts and skills of the Level Five program. (YP)

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MEANINGFUL MATHEMATICS

LEVEL FIVE

RECORDING FORMS
AND
WORKSHEETS FOR PUPIL USE

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SE051 197

Mathematician: ____

"This is my record of numbers for 'Guess My Rule.'"

Numbers from the class (□)	Numbers by the teacher (△)

Rule △ = ______ □ ______

Numbers from the class (□)	Numbers by the teacher (△)

Rule △ = ______ □ ______

Mathematician:____

"I filled in the missing numbers in the tables for rules."

IN	OUT
0	2
1	3
2	4
4	6
6	8

RULE ____________________

IN	OUT
1	5
2	7
3	9
5	13

RULE ____________________

IN	OUT
0	0
1	1
2	4
4	16
6	36

RULE ____________________

IN	OUT
2	5
4	11
5	14
6	17

RULE ____________________

IN	OUT
0	5
1	7
3	11
5	15

RULE ____________________

IN	OUT
0	1
1	1 1/2
2	2
4	3
5	3 1/2

RULE ____________________

Mathematician:____

I used the tables of numbers to (1) find the rule and (2) make the graph of the rule."

IN	OUT
0	2
1	5
2	8
3	11
4	14

RULE:____________________

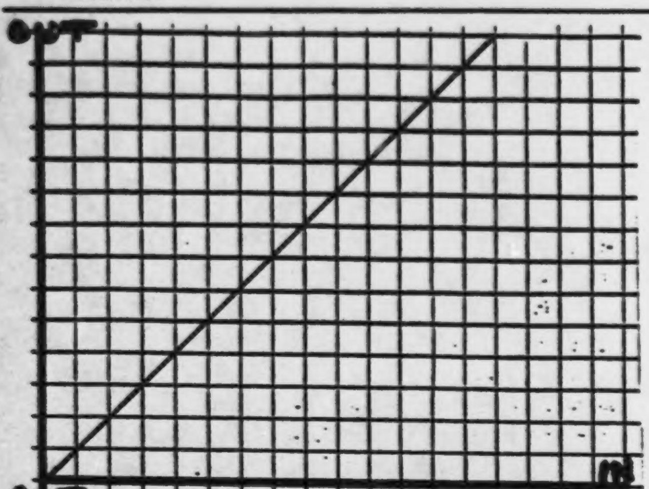
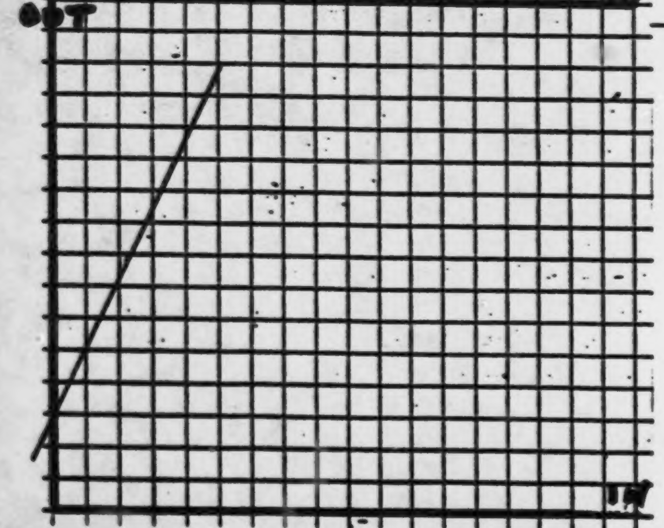
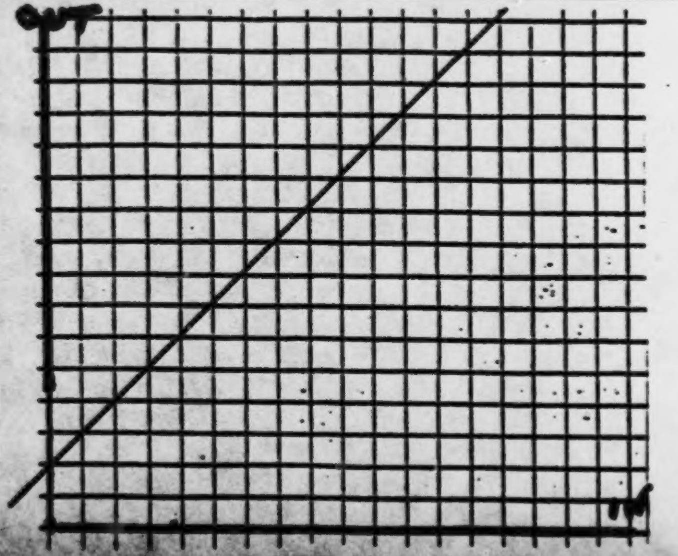
IN	OUT
4	17
2	9
0	1
3	13
1	5

RULE:____________________

IN	OUT
0	5
1	8
3	14
4	17

Mathematician:____

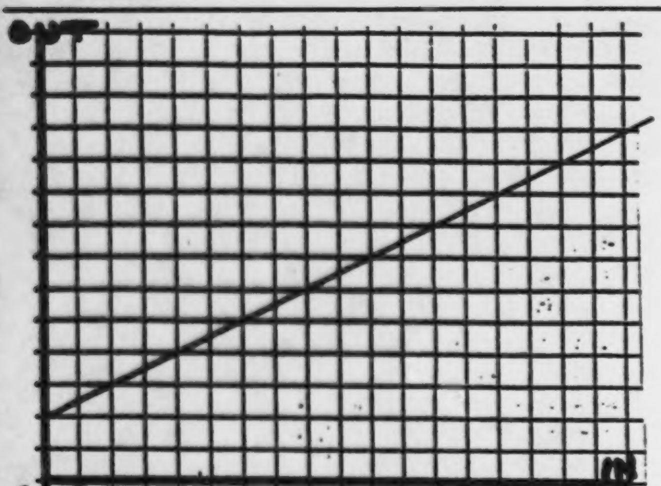
"I found rules for the graphs given."

GRAPH	**RULE**
	RULE:____________________________
	RULE:____________________________
	RULE:____________________________

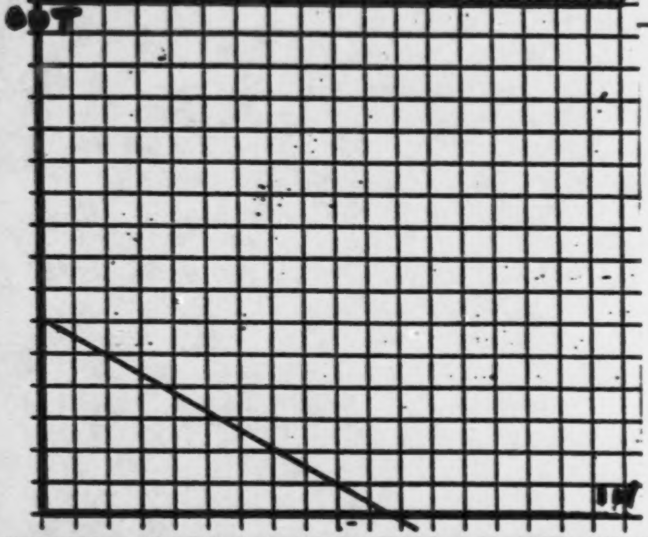
Mathematician:____

"I found rules for the graphs given."

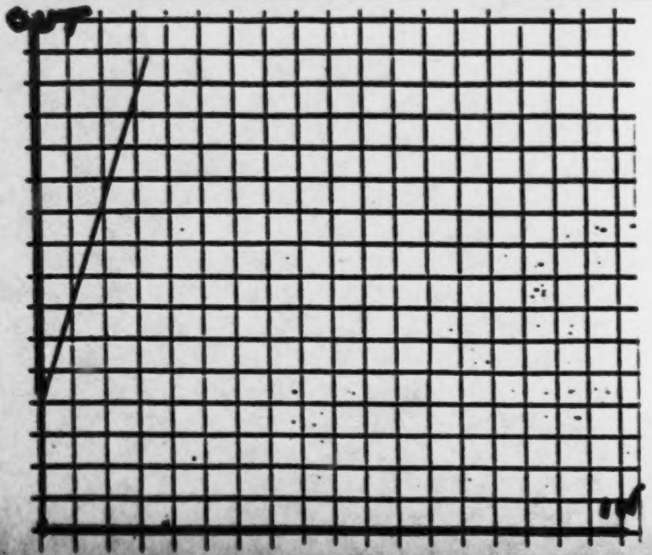
GRAPH	RULE



RULE:____________________________



RULE:____________________________



RULE:____________________________

Mathematician:____

"I completed the following showing how a product is expressed as a sum or difference of products."

PRODUCT	SUM OR DIFFERENCE
Example: 5 (7 + 3)	5 x 7 + 5 x 3 = 35 + 15 = 50
6 (4 - 2)	6 x 4 - 6 x 2 = 24 - 12 = 12
5(6+1)	
4(8-3)	
3(9+2)	
7(9-5)	
6(11+2)	
5(8-3)	
7(8+5)	

6.9.89.1

Mathematician:______________________________________

"I completed the following showing how a product is expressed as a sum or difference of products."

PRODUCT	SUM OR DIFFERENCE
Example: $5(7+3)$	$5 \times 7 + 5 \times 3 = 35 + 15 = 50$
$6(4-2)$	$6 \times 4 - 6 \times 2 = 24 - 12 = 12$
$10(8+3)$	
$11(7-4)$	
$9(9-2)$	
$12(4+3)$	
$12(5-2)$	
$10(12+1)$	
$10(12-5)$	

Mathematician:________________________________

"I changed the products in sums or differences as indicated."

Product	Sum or Difference	Shown as equal
Example: 3 (7 + 5)	3 (7) + 3 (5)	3(12)=36; 3(7)+3(5)=21+15=36
9(2+3)		9(5)= 45;
8(5-2)		
6(4-3)		
7(2+7)		
4(8+3)		
5(8-3)		
7(1+6)		
8(10-3)		
9(2+3)		
10(5-2)		
7(8+4)		

Mathematician:____________________________________

"I changed the products in sums or differences as indicated."

Product	**Sum or Difference**	**Shown as equal**
Example: **3 (7 + 5)**	**3 (7) + 3 (5)**	**3(12)=36; 3(7)+3(5)=21+15=36**
4(3+2)		
5(6−1)		5(5)= 25;
3(5+3)		
6(8−3)	6(8)− 6(3)	
5(3+6)		
7(2+5)		
4(8+2)		
7(9−2)		
5(8−3)		
4(3+5)		
6(6+2)		

1.3892/

Mathematician: ______________________________

"I showed the equality between adding two arrays and a single array in these exercises."

Given array	Two arrays	Number Sentences
Example: **5 x 8 = 40**	**5 (7 + 1)** **5 (6 + 2)** **5 (5 + 3)** **5 (4 + 4)**	**5 (7+1)=5x7+5x1=35+5=40** 5 (6+2) = 5x6+5x2 = 30 + 10 = 40 5 (5+3) = 5x5+5x3 = 25+15 = 40 5 (4+4) = 5x4+5x4 = 20+20 = 40
6x9 = 54	6 (5+4) 6 (6+3) 6 (10-1) 6 (11-2)	
4x11 = 44	4 (7+4) 4 (8+3) 4 (12-1) 4 (10+2)	
5x 7 = 35	5 (4+3) 5 (6+1) 5 (10-3) 5 (12-5)	
6x12 = 72	6 (6+6) 6 (4+2) 6 (8+4) 6 (15-3)	
6 x 10 = 60	6 (5+5) 6 (8+2) 6 (12-2) 6 (13-3)	

Mathematician:________________________________

"I showed the equality between adding two arrays and a single array in these exercises."

Given array	Two arrays	Number Sentences
Example: 5 x 8 = 40	5 (7 + 1) 5 (6 + 2) 5 (5 + 3) 5 (4 + 4)	5 (7+1)=5x7+5x1=35+5=40 5 (6+2) = 5x 6+5x2 = 30 + 10 =40 5 (5+3) = 5x5 +5x3 = 25+15 =40 5 (4+4) = 5x4+5x4 = 20+20 =40
7x 12 = 84	7 (7+5) 7 (8+4) 7 (14-2) 7 (20-8)	
9x 8 = 72	9 (5+3) 9 (6+2) 9 (10-2) 9 (12-4)	
10 x 10 =100	10 (5+5) 10 (6+4) 10 (15-5) 10 (16-6)	
3x 21 = 63	3 (7+14) 3 (20+1) 3 (30-9) 3 (25-4)	
5x 11 = 55	5 (7+4) 5 (9+2) 5 (15-4) 5 (20-9)	

Mathematician:____

"I found the missing number in each of these."

Given Ratio A	B	Number of A	Number of B
2	5	4	
3	4		12
5	3	10	
3	2	9	
4	3		9
6	5		10
5	2	25	
4	7	12	
2	3	10	
5	6		18

1/2968

Mathematician:________________________________

"I used proportions to find these answers."

PROBLEM	PROPORTION	ANSWER
There are 4 boys for every 3 girls in the 6th grade. There are 12 girls in the class. How many boys are there? How many children are in the class?		1. 2.
If a bag of M&Ms has 12 brown and 7 red ones, how many bags would you have to buy to get 48 brown M&Ms? How many red M&Ms would be in the bag?		1. 2.
A "mystery box" contains 5 snappers and 2 cracklers. How many boxes would you open to get 30 snappers? How mahy cracklers would you get?		1. 2.
For every 8 apples you buy, the store adds as a bonus 3 tangerines. When you buy 32 apples, how many tangerines will you get? How many pieces of fruit will you have?		1. 2.
For every 7 hits Tom gets, Willie gets 5 hits. How many hits will Tom have had when Willie has had 25 hits?		1.

6.9.89.2

Mathematician:____ Pg. 2

"I used proportions to find these answers."

PROBLEM	PROPORTION	ANSWER
Jean's closet has 3 sweaters for every 8 blouses. If she had 6 times as many of each, how many sweaters and how many blouses would she have?		sweaters: blouses:
A dentist finds that for every 2 fillings needed for a third grader, 3 fillings are needed for a fifth grader. If he fills the teeth of 21 fifth graders, how many third graders had their teeth filled?		1.
		6.9.89.2a

Mathematician:____

"I changed each phrase to one with per and wrote the symbol that shows this."

Example:

Statement	Per	/
A book costs $5.00	$5.00 per book	$5/book
A candy bar costs 50¢		
A soda costs 69¢		
A tire costs $28.95		
A quart of milk costs $0.85		
A can of syrup weighs 2 pounds		
1 can of oil holds 1.5 gallons		
A book has 230 pages		
A pound of pears costs 59¢		
A recipe uses 2 cups of flour		
A class has 30 students		
A can of tennis balls contains 5	5 balls per can	
An audio tape holds 90 minutes		
An audio tape costs $1.50		

1;3088

Mathematician:____

"I found the answers to these by first finding the UNITARY rate.
I labelled all answers."

PROBLEM	UNITARY RATES	ANSWERS
EXAMPLE: Jane runs 5 kilometers in an hour. How far can she run in 3 hours?	5 km./hr.	3 hrs (5km/hr.)= 15 km.
Grapes cost 99¢ for one pound. How much will 3 pounds cost?		
Nelson averages 3 1/4 yards on each ball carry. How much should he gain on 16 carries?		
A store gives 2 free cokes for every 9 that are bought. How many free cokes will you get if you buy 18 cokes?		
One bottle of soy sauce has 12 ounces. How many bottles to buy to get 36 ounces?		
1 pound of margarine has 2 cups of margarine. How many pounds of margarine to buy for a recipe calling for 6 cups of margarine?		
Bill earns $4.00 for each hour worked cutting grass. How much will he earn in 5 hours of work?		
John lays 125 bricks in an hour. How long will he work to lay 500 bricks?		
Shrimp are packed 16 to a box. How many boxes are needed to feed 12 people who eat 4 shrimp apiece?		
An 8 oz. jar of vitamin pills has 50 pills. How many pills should be in a 24 oz. jar?	50 pills/8 oz. =25 pills/4 oz.	
One gallon of milk weighs 8.6 lb. If there are 4 quarts in one gallon, how much does one quart of milk weigh?		
Vinegar must have 1 gram of acetic acid for 25 milliliters of vinegar. How many grams of acetic acide are in 500 milliliters of vinegar?		

Mathematician:____

"I found the costs of the following grocery lists."

PURCHASE		COST
2 pounds of pork steak one 3 pound cabbage 4 fresh cucumbers 1 42 oz. package outmeal 1 2 lb. bowl of spread margarine 1/2 gallon ice cream	Total Cost	
4 pounds of chicken breast 1 pound of butter 4 cans of soup 3 pounds of pears 1 2 pound bag of brown sugar	Total Cost	
3 pounds of walnuts 3 pounds of chuck roast 3 cartons chip dip 1 18 oz. jar peanut butter 1 64 oz. bottle apple juice 2 rolls towels	Total Cost	
2 oranges 1 Surf laundry detergent 1 pkg. Pillsbury Cake Mix 4 lbs. Lennardo Spaghetti 5 pounds ground beef	Total Cost:	
24 oz. skinless franks 3 lbs. fresh bratwurst 3 lbs. fresh cabbage 12 oz. mozzarella cheese 12 pack Diet Coke 24 pack Elf Soda	Total Cost:	
1/2 lb. hard salami 4 cans chicken noodle soup 1 loaf French bread 1 bottle Ragu Spaghetti Sauce 4 - 16 oz. cans baked beans	Total Cost:	

MEATS

FAMILY PAK BONELESS
COUNTRY STYLE RIBS
$1.19 LB.

FAMILY PAK
PORK STEAK
89¢ LB.

REGULAR 3 LB. PKG.
GROUND BEEF
89¢ LB.

WILSON'S CORN KING
SKINLESS FRANKS
69¢ 12 OZ. PKG.

WILSON'S CORN KING
SLICED BACON
99¢ 1 LB. PKG.

KLEMENT'S FRESH
BRATWURST
$1.59 LB.

ON-COR CORN DOGS .... LB.	$1.59
ON-COR BBQ. OR CHEESE CHICKEN NIBBLERS .... LB.	$2.49
ELF HERRING FILLETS .... [illegible]	$2.19
OUR HOMEMADE BY THE PIECE STYLTA .... LB.	$2.29
[illegible] 8 VARIETIES SLICED THIN MEATS .... [illegible]	2/99¢
MR. TURKEY GROUND TURKEY 1 LB. PKG.	99¢

PRODUCE

NAVEL
ORANGES
10 FOR 99¢

FRESH CRISP CABBAGE .... LB.	25¢
SEEDLESS RED GRAPES .... LB.	99¢
DELICIOUS KIWI FRUIT	3/$1
RUBY RED GRAPEFRUIT ..... [illegible]	$1.99
FRESH CUCUMBERS	4/$1
FRESH GREEN PEPPERS	3/$1

GRADE AA
LARGE EGGS
38¢ 1 DOZ. CTN.
WITH COUPON BELOW

DOVE LIQUID
DISH DETERGENT
$1.59 48 OZ. BTL.
WITH COUPON BELOW

SURF LIQUID
LAUNDRY DETERGENT
$4.99 1 GAL. BTL.
WITH COUPON BELOW

BUSH'S
BAKED BEANS
2/$1 16 OZ. CANS

RAGU HOMESTYLE
SPAGHETTI SAUCE
99¢ [illegible]

INDIAN SUMMER
APPLE SAUCE
99¢ [illegible]

PILLSBURY
CAKE MIX
69¢ 18½ OZ. PKG.

LEONARDO
MACARONI OR
SPAGHETTI
99¢ 2 LB. PKG.

SUNSHINE
KRISPY CRACKERS
79¢ 1 LB. PKG.

HILLS BROTHERS HOT COCOA MIX ...... [illegible]	99¢
CAMPBELL'S CHUNKY CLAM CHOWDER ...... [illegible]	$1.19
[illegible] OATMEAL ...... [illegible]	$1.49
[illegible]	3/$1
[illegible] CHILI POWDER .... [illegible]	$1.99
[illegible] CHILI SAUCE .... [illegible]	99¢
[illegible] WORCESTERSHIRE SAUCE .... [illegible]	89¢
[illegible]	79¢
[illegible]	99¢
[illegible] MICROWAVE POPCORN [illegible]	4/$1.19
[illegible] CHEESE [illegible]	99¢
[illegible]	2/99¢
[illegible] PRIDE GRADE A PEANUT BUTTER .... [illegible]	$1.19
DANISH BUTTER COOKIES .... [illegible]	$1.29
CHERRY HILL APPLE CIDER OR APPLE JUICE .... [illegible]	$1.19
DINTY MOORE BEEF STEW .... [illegible]	$1.69

DAIRY FOODS

VELVET SOFT
SPREAD MARGARINE
69¢ 2 LB. BOWL

KEMPS CHIP DIP .... [illegible]	3/$1
FOOD CLUB CREAM CHEESE ...... [illegible]	78¢
FOOD CLUB SLICED MOZZARELLA ...... [illegible]	89¢
FOOD CLUB GRATED PARMESAN .... [illegible]	88¢
KRAFT CHEESE SPREAD .... [illegible]	79¢

FROZEN FOODS

OLD ORCHARD
ORANGE JUICE
99¢ 12 OZ. CAN

MR. DEES GOLDEN ROUNDS . [illegible]	$1.29
BANQUET SALISBURY STEAK OR SLICED TURKEY ENTREES . [illegible]	$1.99
MR. DEES SHRIMP CURLS ... 11 OZ. PKG.	$2.49
KEMPS QUALITY CHEK'D ICE CREAM .... [illegible]	$1.99
KEMPS FROZEN YOGURT .... ½ GAL. [illegible]	$2.49

COUPON
GRADE AA
LARGE EGGS
38¢ 1 DOZ. CTN.
[illegible]

COUPON
DOVE LIQUID
DISH DETERGENT
$1.59 48 OZ. BTL.
[illegible]

COUPON
SURF LIQUID
LAUNDRY DETERGENT
$4.99 1 GAL. BTL.
[illegible]

COUPON
BUY 2 GET 1 FREE
BUY: Any TWO Packages Ken-L-Ration® PUPPERONI® Jerky Snack Sticks for Dogs.
GET: Any ONE Package Ken-L-Ration® PUPPERONI® Jerky Snack Sticks for Dogs FREE C-[illegible]
[illegible]

COUPON
KIBBLES'N BITS'N BITS'N BITS, KIBBLES'N BITS'N GRAVY BITS®, or PUPPY KIBBLES'N BITS
DOG FOOD
$1.00 OFF ANY 4 LB. BAG
C-[illegible]
[illegible]

COUPON
BUY THREE CANS
Puss'n Boots Supreme
CANNED CAT FOOD
GET ONE CAN FREE
UP TO 2[illegible]¢
C-214
[illegible]

FRENCH BREAD
85¢
1 LB. LOAF

MARGARINE
2/$1
1 LB. PKG.

SOUP
2
79¢

FLAV-O-RITE GRADE A FAMILY PACK
CHICKEN BREAST
$1 18
LB.

USDA CHOICE BEEF BNLS.
CHUCK ROAST
$1 39
LB.

1 LB.
FLAV-O-RITE
SOLID BUTTER
$1 19
1 LB. PKG.

SUPER COUPON

#500

ELLIOTTS SKINLESS
PORK LINKS
12 OZ. PKG.
79¢

LIMIT 1 PER COUPON, LIMIT ONE COUPON PER FAMILY.
PRICES GOOD THRU SAT., DEC. 3, 1988. MUST BE 16 YRS. OR OLDER TO REDEEM.

LARGE EGGS
39¢

PORK CHOPS
1 19
LB.

PEARS
79¢
LB.

DOWNY SOFTENER
$2 29

TOASTEDS WHEAT, SESAME, BUTTERCRISP
$1 49

PIZZA ROLLS
99¢

COKE, DIET COKE
$2 99

FLAV-O-RITE
WALNUTS
$1 99
1 LB. PKG.

HARD SALAMI
$3 29
LB.

BROWN SUGAR
87¢
2 LB. BAG

ELF SODA
$3 99
24 PACK
12 OZ. CANS

ARM CUT ROAST
1 59
LB.

Mathematician: ______________________________

"I wrote a 'story' problem for each open number sentence."

NUMBER SENTENCE	STORY PROBLEM
$\square + 26 = 85$	
$4 \times \square = \$.76 + \$.36$	
$132 - 108 = 6 \times \square$	

Problem Solving Lesson Two

Mathematician:____

"I wrote a 'story' problem for each open number sentence."

NUMBER SENTENCE	STORY PROBLEM
$\#.69 + \square = 3 \times \#.49$	
$6 \times \square = 40 + 8$	
$\square \times 9 = 35 + 10$	

Mathematician:____

"I wrote a 'story' problem for each open number sentence."

NUMBER SENTENCE	STORY PROBLEM
$\$.50 + \square = 6 \times \$.25$	
$\square - \$.32 = \$.68 + \$.19$	
$2 \times \square = \$3 + \$.98$	

Mathematician:____

"I worked these problems and wrote the number sentence needed for each."

Problem	Number Sentence
Jean read 32 books during the year. Joyce read 36 books during the year. 1. How many books did both girls read? 2. Joyce read how many books more than Jean?	1. 2.
A ferris wheel car holds 3 adults or 4 children. One third of the 24 cars were full of adults; the rest were filled with children. How many people were riding the ferris wheel?	
At his party Tom had 10 full six packs of cola and 5 other cans of cola. How many cans of cola did Tom have?	
Three-fourths of the boys at Super High School wore red sox on blue and red day. 60 boys wore sox. How many boys go to Super High School?	
Janine's coin collection was mostly in albums. She had 3 albums with 30 pages each. One had dimes; one had quarters and one had half dollars, 100 dimes fit on a page; 60 quarters fit on a page and 50 half dollars fit on a page. 1. How many coins are in her collection? 2. What is the face value in money of her collection?	1. 2.
There are 300 shops at the mall. There are 5 small shops for each large shop. 1. How many small shops are at the mall? 2. How many large shops are at the mall?	1. 2.
The shops at the mall are open 10 hours each day during the week and 12 hours on Saturday and Sunday. The shops are open for how many hours during a 4-week period?	

Problem Solving LESSON EIGHT

Cotton candy costs $.50 and peanuts cost $.75 at the county fair. Ms. Jones' class of 30 children go to the fair. 1/3 buy cotton candy and the rest peanuts. How much do the children spend?	
The manager of the school store overstocked pencils. He bought 5 dozen boxes. Each box had 10 pencils. He put them on sale at $.05 and sold 3/5 of them. 1. How much money did he receive for those sold? 2. How many pencils were left after the sale?	1. 2.
On a trip to the zoo, the class stopped to buy soft drinks. The small size cost $.50 and the large size $.75. 3/5 of the class of 30 bought the small size. 1. How much was paid for the large size cups bought? 2. How many children bought the large size? 3. On which size was more money spent? 4. How much more money was spent on that size?	1. 2. 3. 4.
A rancher had 75 horses. He bought twice as many as he had. How many horses did he have in all?	
Ms. Smith divided her class into 2 teams of 15 each. On an oral drill, Team A had a total of 30 points and Team B a total of 45 points. 1. What was the average point score of a Team A member? 2. What was the average point score of a Team B member? 3. A Team B member got how many times as many points as a Team A member?	1. 2. 3.
	10888

Mathematician:____

"I wrote questions to make math problems from what is given."

Given	Questions
Tennis balls 6/can Golf balls 10/box	1. 2. 3.
Irene and Joyce each filled a trash bag with aluminum cans. Each bag had 120 cans. They are paid .07/can at the recycling center.	1. 2. 3.
SALE PRICES Small Pizza $ 3.49 Medium Pizza $ 5.39 Large Pizza $ 6.99 extra toppings are $.89 each	1. 2. 3.
Donna needs 120 paper plates for a birthday party. A package of 25 costs $1.09 and a package of 50 costs $1.99	
wheel is red; the others are blue. There are 9 red cars on the ferris wheel.	1. 2. 3.

At the homecoming football game there were 5 local fans for every 3 visiting fans.	1. 2. 3.
Each box held 48 pompoms. The truck delivered 5 boxes to the high school and 3 boxes to the junior high school.	1. 2. 3.

Mathematician: ______________________________

"I wrote problems using these numbers. The circled number answers the question in each problem."

NUMBERS GIVEN	MY PROBLEM
5 3 12 ③	
8 4 ㉑ 11	
6 3 9 ⑨	

Mathematician:______________________________________

"I wrote problems using these numbers. The circled number answers the question in each problem."

NUMBERS GIVEN	MY PROBLEM
27 15 ⑫	
42 7 ⑥	
7 6 26 ⑯	

Mathematician: ____________________

"I wrote problems using these numbers. The circled number answers the question in each problem."

NUMBERS GIVEN	MY PROBLEM
$1.49 $0.49 ④ $0.25	
⑱ 3 26 28	
5 25 (90) 35	

Mathematician: ______________________________

"I wrote problems using these numbers. The circled number answers the question in each problem."

NUMBERS GIVEN	MY PROBLEM
28 $\textcircled{16}$ 44	
\$1 \$2 $\textcircled{\$3}$ \$6	
$\frac{1}{2}$ $\frac{2}{3}$ 1 $\textcircled{\frac{1}{6}}$	

Mathematician: ____________________

"I made bar graphs of the following sets of data."

DATA		GRAPH
Amount spent on education per student		
Minnesota	**$3322**	
California	**$2981**	
Texas	**$2960**	
Maine	**$2839**	
Alabama	**$2082**	
Average weekly wages		
Accountant	**$ 379**	
Auto Mechanic	**$ 285**	
Bank Teller	**$ 189**	
Cooks & Chefs	**$ 171**	
K-6 Teacher	**$ 322**	
Plumber	**$ 404**	
Secretary	**$ 229**	
Points Scored		
Worthy	**20**	
Rambis	**8**	
Jabbar	**12**	
Johnson	**19**	
Cooper	**4**	
McAdoo	**12**	

Mathematician:____

"I made bar graphs of the following sets of data."

DATA		GRAPH
Miles travelled to school		
More than 5	4	
3 to 5	6	
1 to 3	10	
less than 1	14	
Hours spent on homework		
Less than one	12	
One to two	6	
More than two	3	
TV shows watched		
Cartoons	16	
Cheers	8	
Bill Cosby Show	9	
Newhart	3	
MASH	7	

Mathematician: ______________________________

"I made circle graphs of each of the following sets of data. I rounded the numbers first."

DATA — GRAPH

Amount spent on education per student

Minnesota	$3322
California	$2981
Texas	$2960
Maine	$2082

Average weekly wages:

Accountant	$ 379
Auto Mechanic	$ 285
Bank Teller	$ 189
Cooks & Chefs	$ 171
K-6 Teachers	$ 322
Plumber	$ 404
Secretary	$ 229

Points Scored:

Worthy	20
Rambis	8
Jabbar	12
Johnson	19
Cooper	4
McAdoo	12

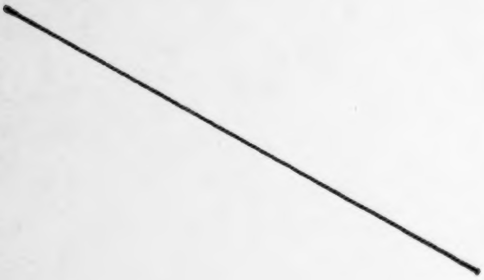
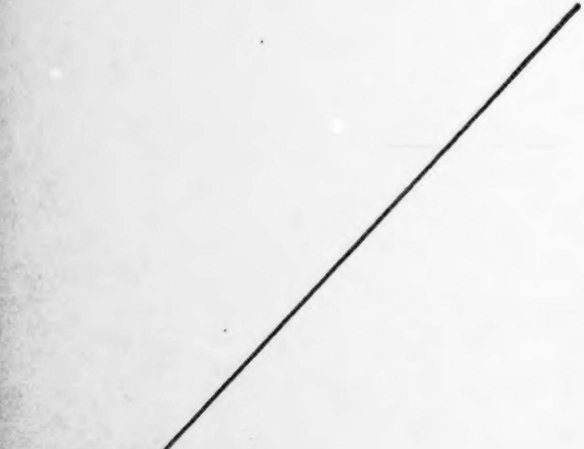
Mathematician:____pg. 2

"I made circle graphs of each of the following sets of data. I rounded the numbers first."

DATA		GRAPH
Miles travelled to school:		
More than 5	4	
3 to 5	6	
1 to 3	10	
less than 1	14	
Hours spent on homework:		
Less than one	12	
One to two	6	
More than two	3	
TV shows watched:		
Cartoons	16	
Cheers	8	
Bill Cosby Show	9	
Newhart	3	
MASH	7	

Mathematician:____

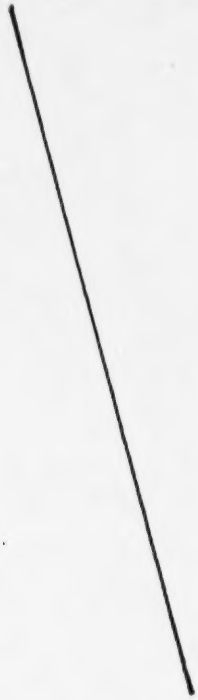
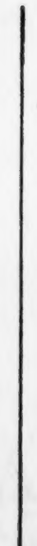
"I first estimated these lengths, then measured them in BOTH inches and centimeters."

LENGTHS	MEASURE	TO THE NEAREST WHAT PART OF A UNIT?
	inches centimeters	
	inches centimeters	

6.12.85.1

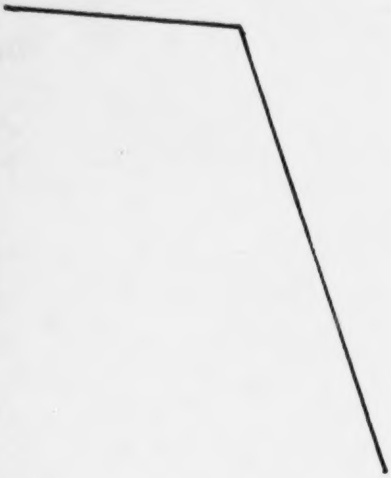
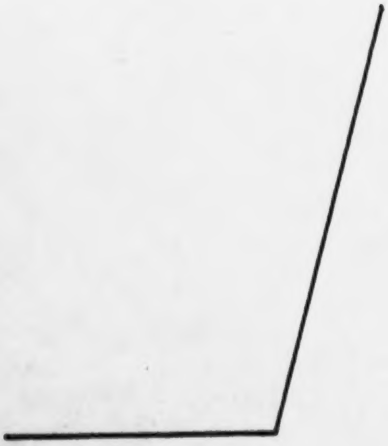
Mathematician:____

"I first estimated these lengths, then measured them in BOTH inches and centimeters."

LENGTHS	MEASURE	TO THE NEAREST WHAT PART OF A UNIT?
	inches centimeters	
	inches centimeters	

Mathematician: ______________________________

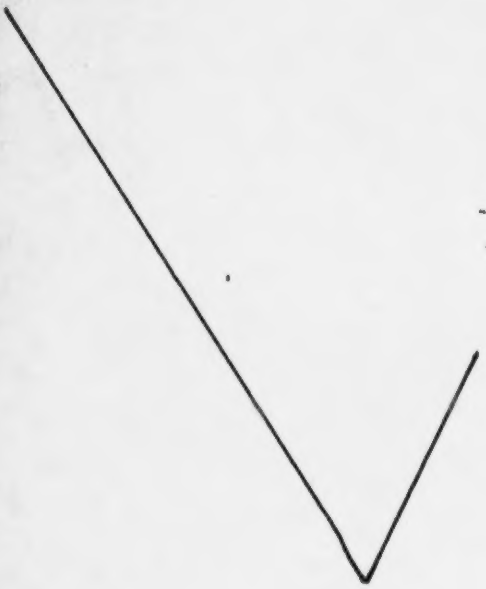
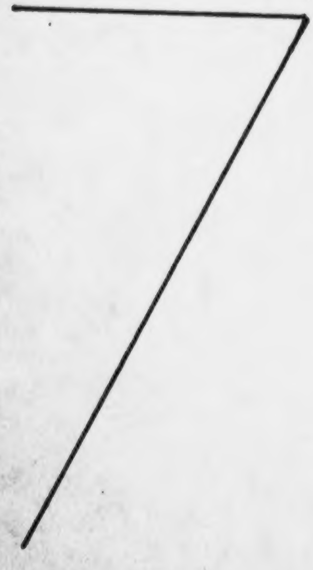
"I first estimated these lengths, then measured them in BOTH inches and centimeters."

LENGTHS	MEASURE	TO THE NEAREST WHAT PART OF A UNIT?
	inches centimeters	
	inches centimeters	

6.12.89.1

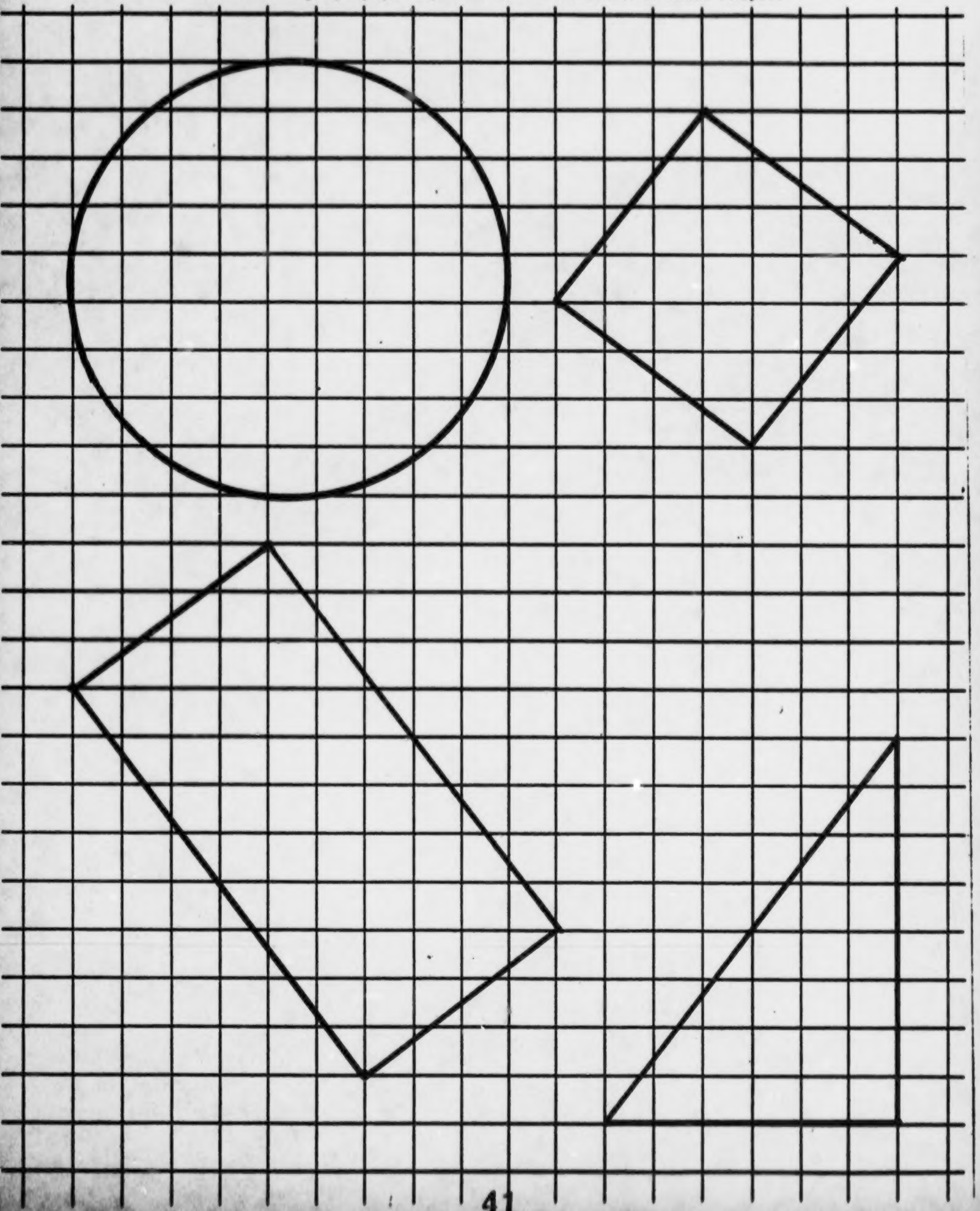
Mathematician:______________________________

"I first estimated these lengths, then measured them in BOTH inches and centimeters."

LENGTHS	MEASURE	TO THE NEAREST WHAT PART OF A UNIT?
	inches centimeters	
	inches centimeters	

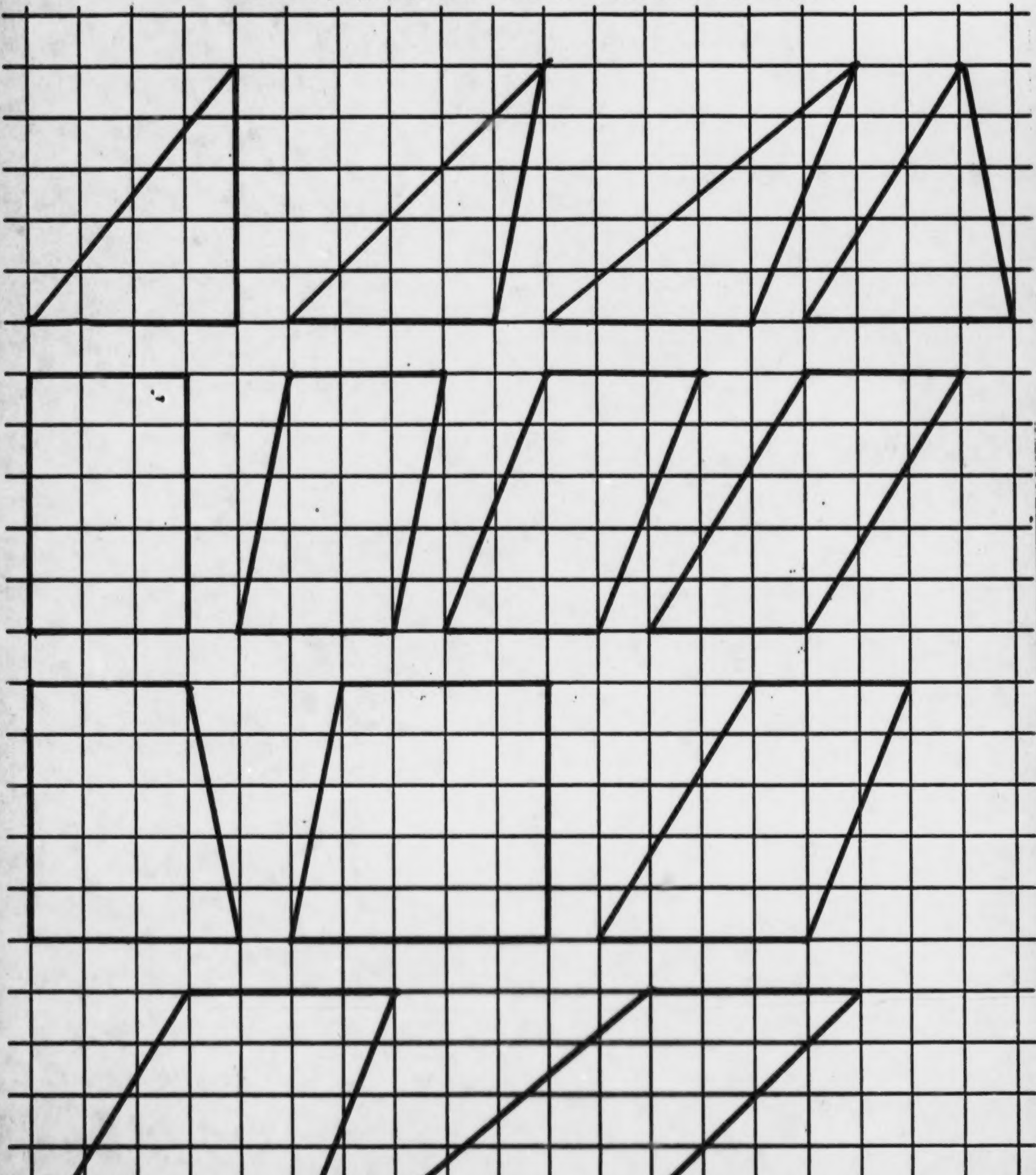
Mathematician:____

"I used the graph paper squares to find the areas of these shapes."



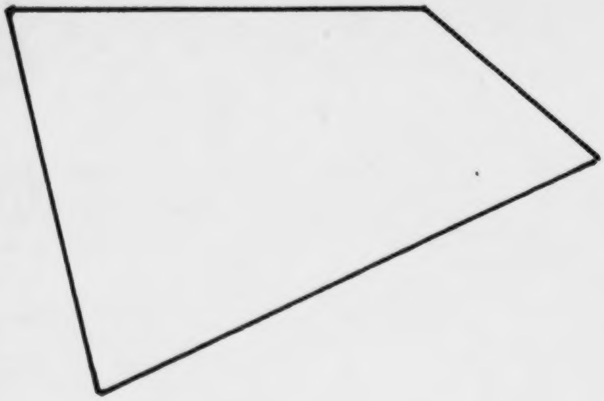
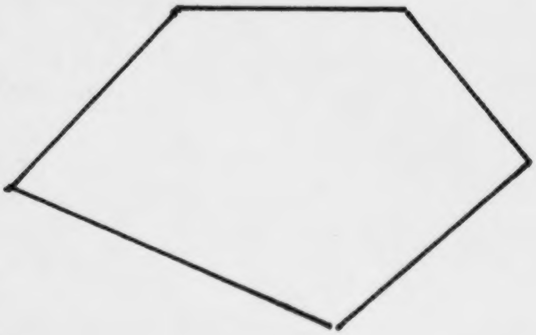
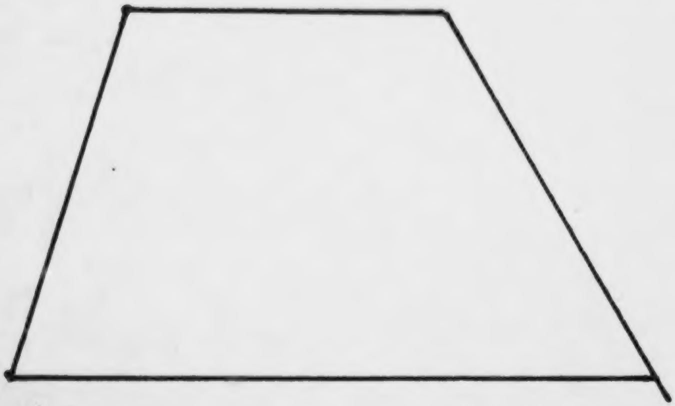
Mathematician:____

"I used the graph paper squares to find the areas of these shapes."



Mathematician:____

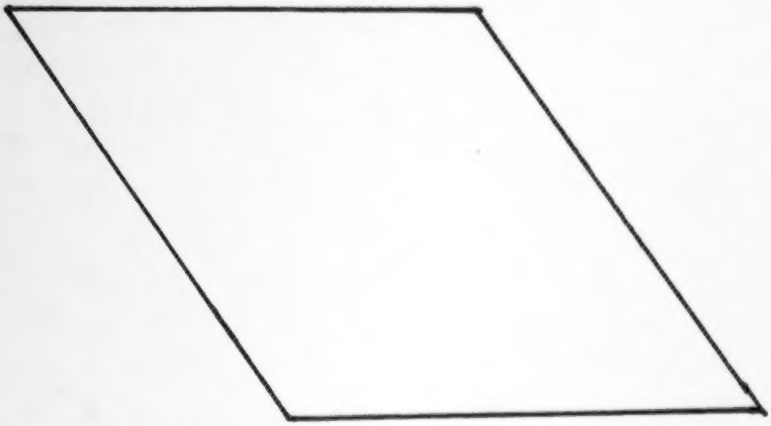
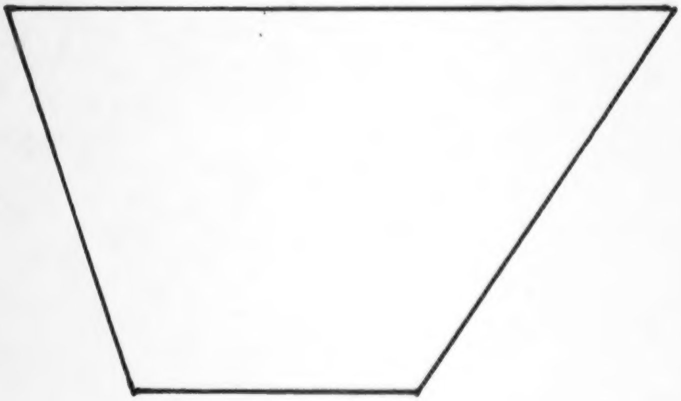
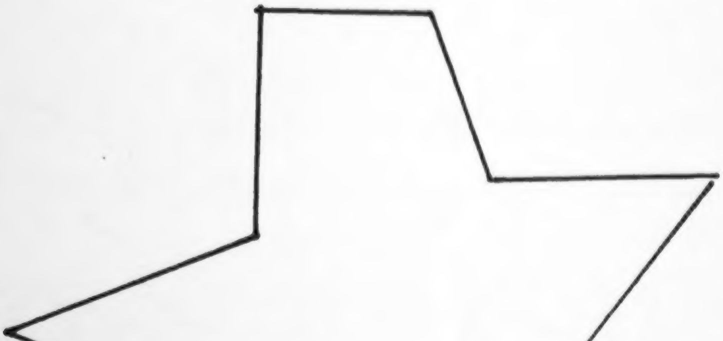
"I used a graph paper transparency to find the areas of these shapes."

SHAPE	AREA
	
	
	

6.12.89.2

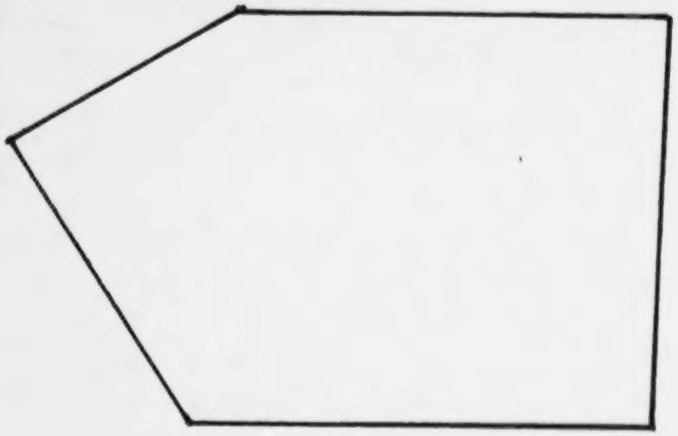
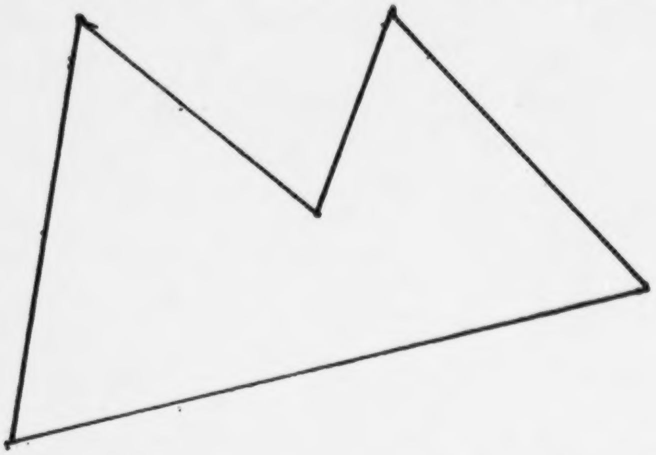
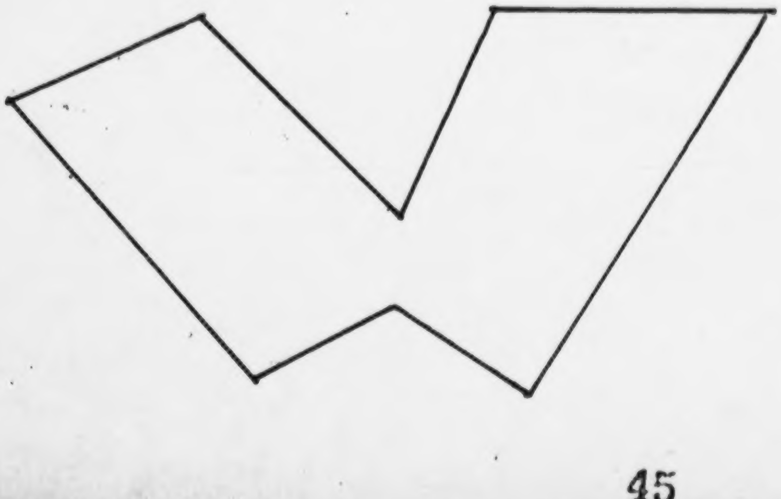
Mathematician:____

"I used a graph paper transparency to find the areas of these shapes."

SHAPE	AREA
	
	
	6.12.89.2

Mathematician:____

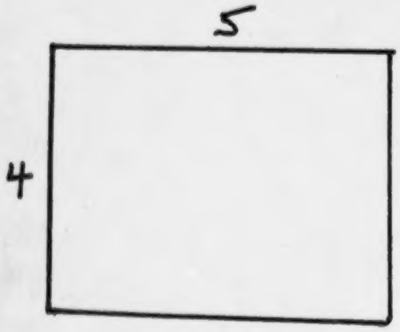
"I used a graph paper transparency to find the areas of these shapes."

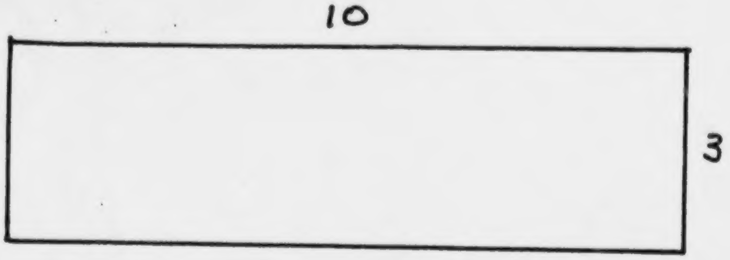
SHAPE	AREA
	
	
	

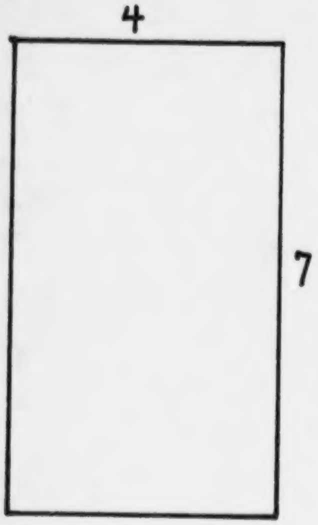
6.12.89.2

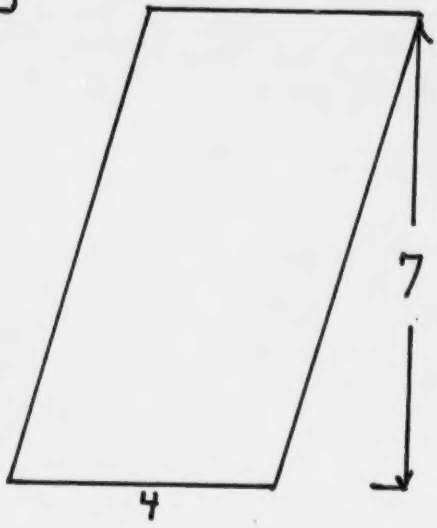
MATHEMATICIAN:____

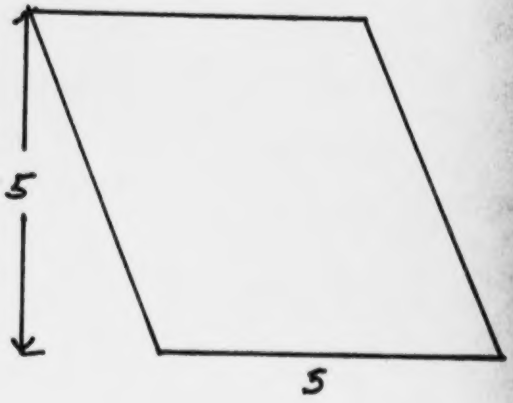
"For each rectangle or parallelogram, I divided it into 2 equal triangles by a line and found the area of one of the triangles."

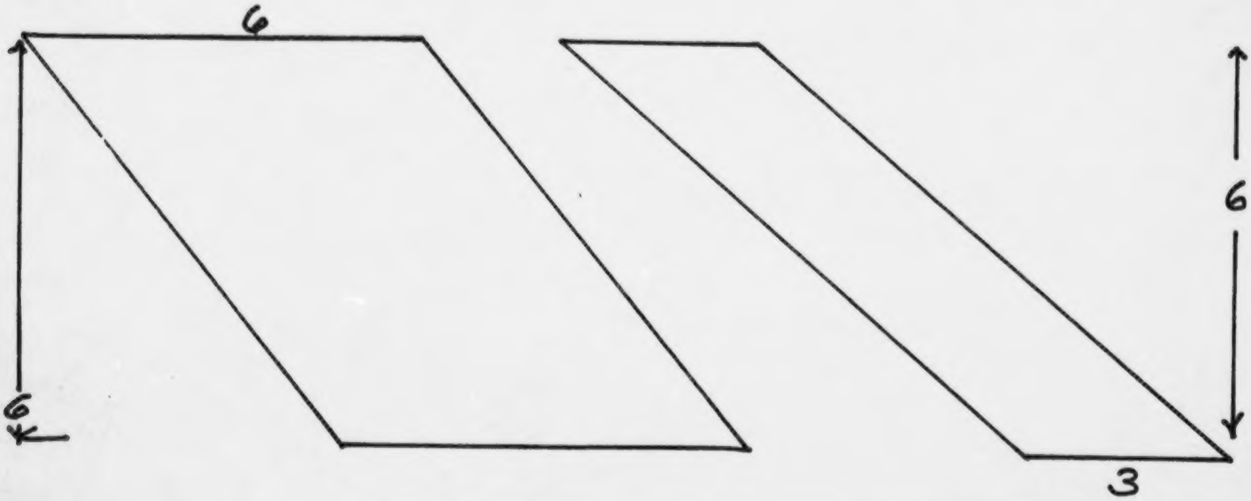


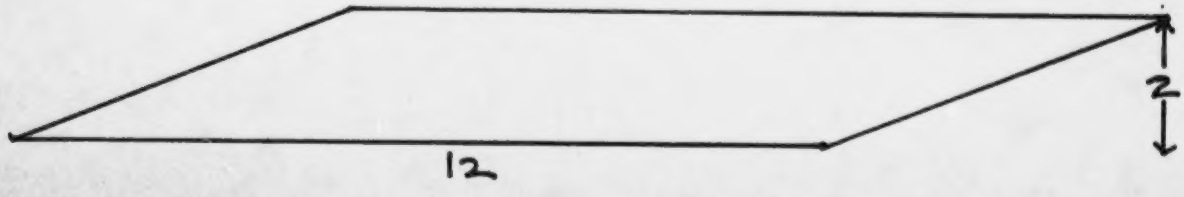






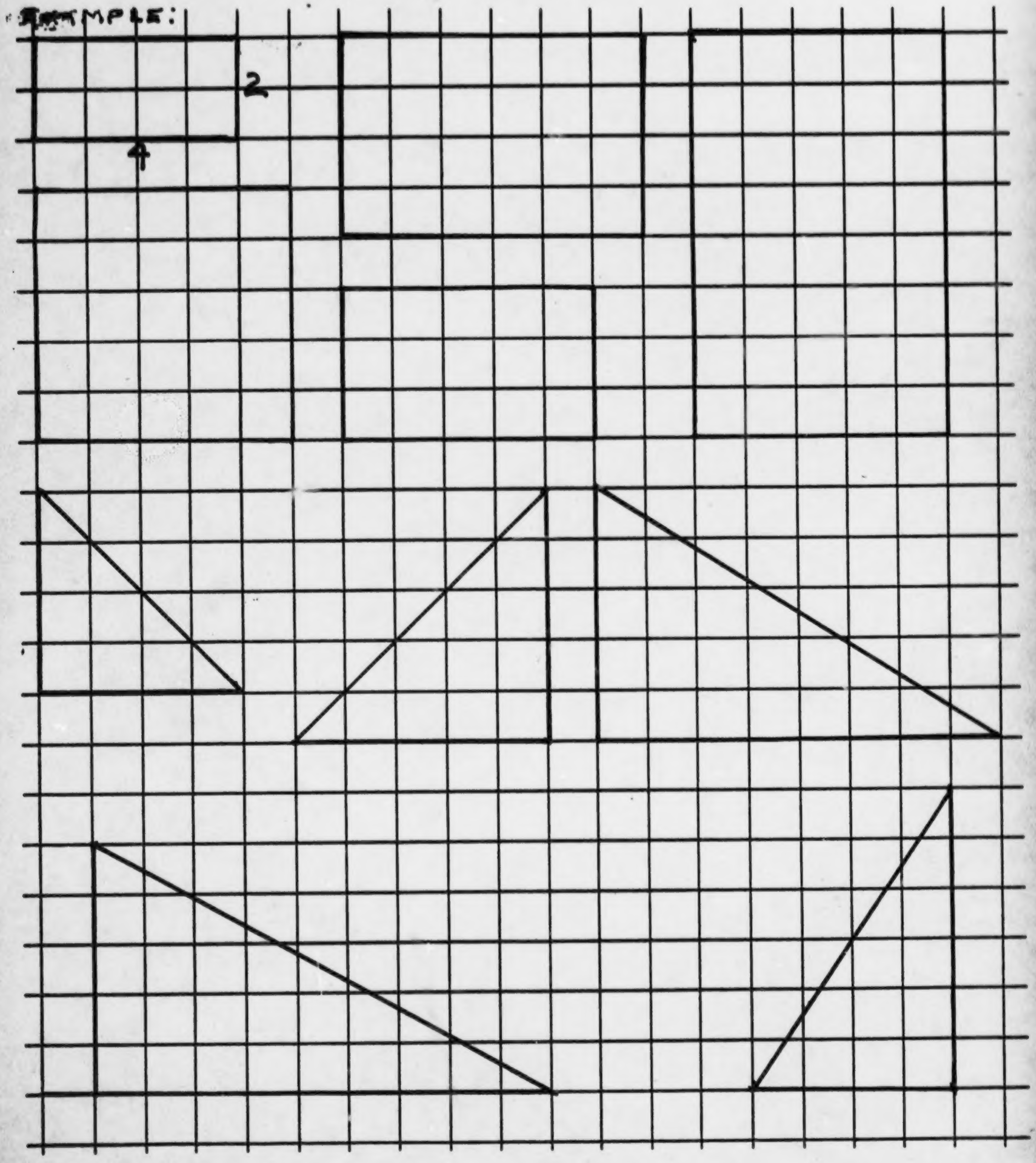






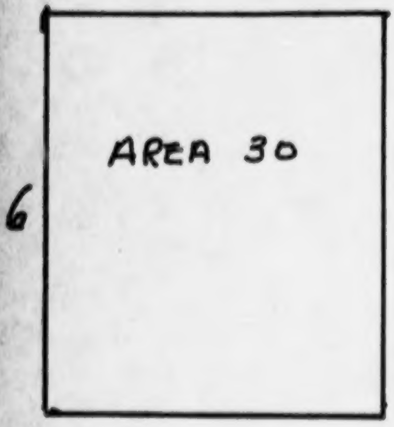
MATHEMATICIAN:____

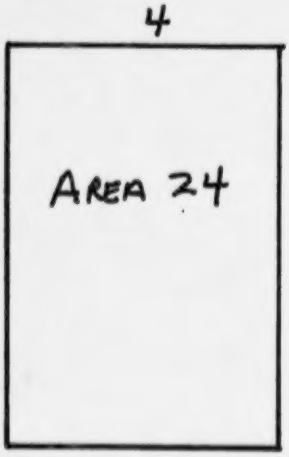
"i used the area to find missing sides of the given shapes."

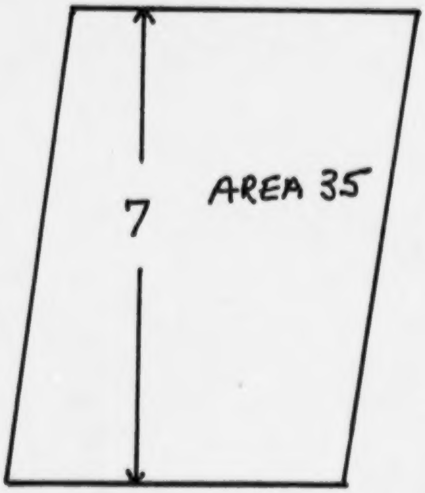


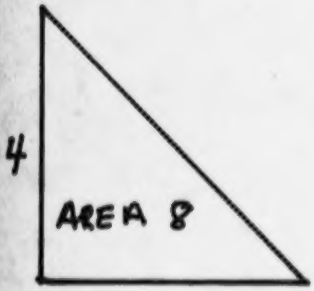
MATHEMATICIAN:____

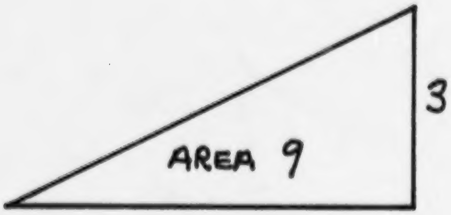
"I used the area and one side to find the other side of the given shapes."

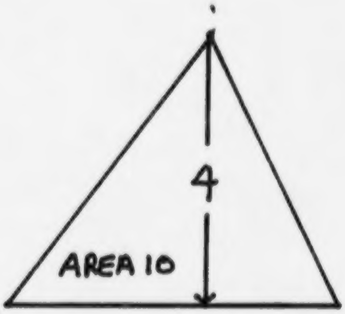


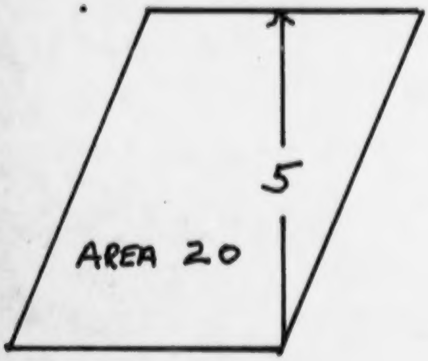


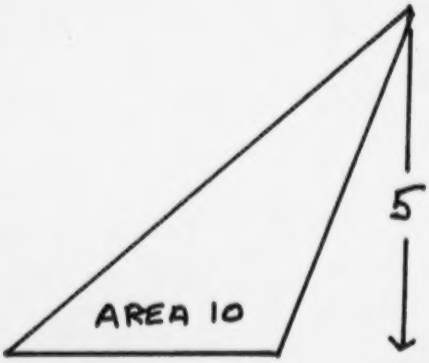


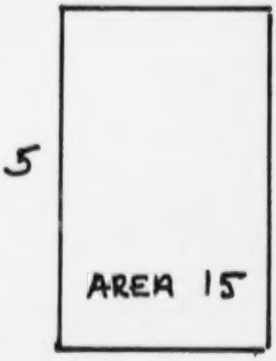


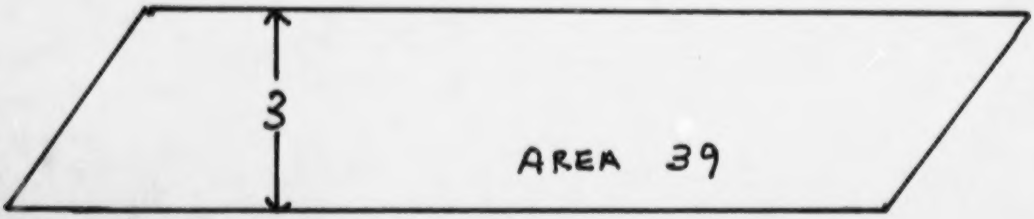












Mathematician:____

"I used a common denominator for these divisions."

Example: 2/3 ÷ 1/5 = 10/15 ÷ 3/15 = 10/3

"When the fractions have the same denominator, I can divide the numerators."

5/6 ÷ 1/3 = ☐

☐ = 7/12 ÷ 5/6

5/12 ÷ 1/4 = ☐

☐ 7/12 ÷ 2/3

2/5 2/3 = ☐

3/4 ÷ 1/4 = ☐

☐ = 5/8 ÷ 1/4

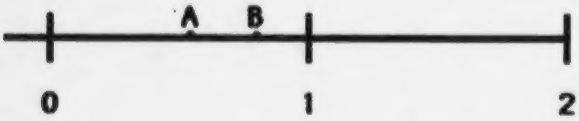
☐ =5/12 ÷ 1/3

7/12 ÷ 1/3 = ☐

3/4 ÷ 7/12 = ☐

☐ = 3/5 ÷ 1/5

☐ = 2/3 ÷ 1/6

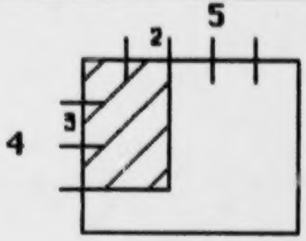


"I put an "X" t.show where B ÷ A would be and a "Y" to show where A ÷ B would be."

110388

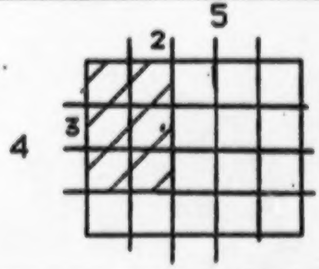
Mathematician:____

"I did these multiplications as requested."

FRACTIONS TO MULTIPLY	RESULT IN LOWEST TERMS	PICTURE
Example: 3/4 x 2/5	3/4 x 2/5 = 6/20 = 3/10	
5/6 x 7/8		
2/3 x 3/4		
5/8 x 7/12		
2/5 x 3/10		

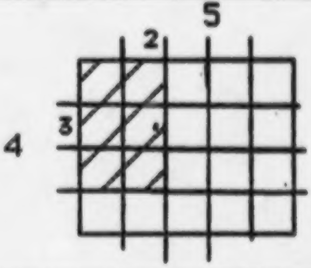
Mathematician:____

"I did these multiplications as requested."

FRACTIONS TO MULTIPLY	RESULT IN LOWEST TERMS	PICTURE
Example: 3/4 × 2/5	3/4 X 2/5 = 6/20 = 3/10	
$\frac{2}{3}$ X $\frac{1}{5}$		
$\frac{2}{3}$ X $\frac{7}{8}$		
$\frac{5}{6}$ X $\frac{3}{4}$		
$\frac{2}{5}$ X $\frac{3}{8}$		

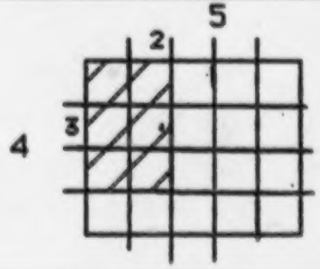
Mathematician:____

"I did these multiplications as requested."

FRACTIONS TO MULTIPLY	RESULT IN LOWEST TERMS	PICTURE
Example: 3/4 x 2/5	3/4 X 2/5 = 6/20 = 3/10	
$\frac{7}{8} \times \frac{3}{5}$		
$\frac{5}{6} \times \frac{2}{3}$		
$\frac{3}{4} \times \frac{1}{3}$		
$\frac{5}{8} \times \frac{1}{5}$		

Mathematician:____

"I did these multiplications as requested."

FRACTIONS TO MULTIPLY	RESULT IN LOWEST TERMS	PICTURE
Example: 3/4 x 2/5	3/4 X 2/5 = 6/20 = 3/10	
$\frac{3}{5} \times \frac{2}{3}$		
$\frac{3}{4} \times \frac{2}{3}$		
$\frac{3}{4} \times \frac{2}{5}$		
$\frac{3}{4} \times \frac{1}{2}$		

MATHEMATICIAN:____

" I used rectangles inside rectangles on graphing paper to show these multiplications."

2/3 x 1/5 = ☐

☐ = 2/3 x 3/4

5/8 x 2/3 = ☐

☐ = 2/3 x 7/8

3/4 x 5/6 = ☐

1/2 x 5/6 = ☐

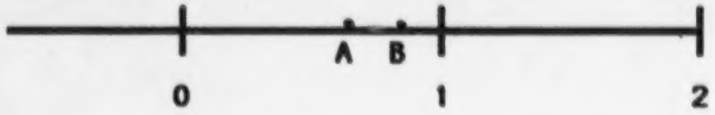
☐ = 3/4 x 2/5

☐ = 1/5 x 3/4

☐ = 5/8 x 1/3

2/3 x 1/4 = ☐

"On the number line A and B are fractions. I put an "x" to show where the product of A X B would be on the number line."



Mathematician: ______________________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{1}{2}$

$\frac{1}{3}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ ÷ ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ ÷ ________

$\frac{1}{2}$

$\frac{2}{3}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ ÷ ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ ÷ ________

Mathematician:____________________________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{4}{5}$

$\frac{5}{6}$

JOINED __________ + __________ = __________

DIFFERENCE __________ = __________ - __________

COMPARED
LARGER TO SMALLER __________ + __________ = __________

COMPARED
SMALLER TO LARGER __________ = __________ + __________

$\frac{5}{6}$

$\frac{7}{8}$

JOINED __________ + __________ = __________

DIFFERENCE __________ = __________ - __________

COMPARED
LARGER TO SMALLER __________ + __________ = __________

COMPARED
SMALLER TO LARGER __________ = __________ + __________

110188

Mathematician: ______________________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{3}{5}$

$\frac{5}{6}$

JOINED __________ + __________ = __________

DIFFERENCE __________ = __________ - __________

COMPARED
LARGER TO SMALLER __________ + __________ = __________

COMPARED
SMALLER TO LARGER __________ = __________ + __________

$\frac{3}{4}$

$\frac{5}{6}$

JOINED __________ + __________ = __________

DIFFERENCE __________ = __________ - __________

COMPARED
LARGER TO SMALLER __________ + __________ = __________

COMPARED
SMALLER TO LARGER __________ = __________ + __________

110188

Mathematician: ____________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{3}{4}$

$\frac{4}{5}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ + ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ + ________

$\frac{3}{5}$

$\frac{1}{2}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ + ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ + ________

110188

Mathematician: ______________________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{1}{3}$

$\frac{1}{5}$

JOINED ____________ + ____________ = ____________

DIFFERENCE ____________ = ____________ - ____________

COMPARED
LARGER TO SMALLER ____________ + ____________ = ____________

COMPARED
SMALLER TO LARGER ____________ = ____________ + ____________

$\frac{2}{3}$

$\frac{4}{5}$

JOINED ____________ + ____________ = ____________

DIFFERENCE ____________ = ____________ - ____________

COMPARED
LARGER TO SMALLER ____________ + ____________ = ____________

COMPARED
SMALLER TO LARGER ____________ = ____________ + ____________

110188

Mathematician: ____________________

"I shaded the bars to show the fractions given. Then I joined the parts, found the difference between the parts and compared the parts two ways."

$\frac{1}{3}$

$\frac{3}{4}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ + ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ + ________

$\frac{2}{3}$

$\frac{3}{4}$

JOINED ________ + ________ = ________

DIFFERENCE ________ = ________ - ________

COMPARED
LARGER TO SMALLER ________ + ________ = ________

COMPARED
SMALLER TO LARGER ________ = ________ + ________

110188

Mathematician:____

"I worked the following fraction examples. Where I had to, I found a common denominator."

1/2 + 1/2 = ☐

☐ = 5/8 + 1/8

☐ = 5/6 - 1/2

☐ = 7/12 + 1/3

3/2 + 4/3 = ☐

5/2 + 7/3 = ☐

12/8 - 5/6 = ☐

1/3 + 1/3 = ☐

1/2 - 1/4 = ☐

☐ = 5/6 - 1/3

5/12 - 1/4 = ☐

☐ = 15/12 + 7/6

9/8 - 3/4 = ☐

☐ = 4/3 - 1/2

5/6 + 1/6 = ☐

3/8 - 1/8 = ☐

5/8 - 1/4 = ☐

7/12 - 1/3 = ☐

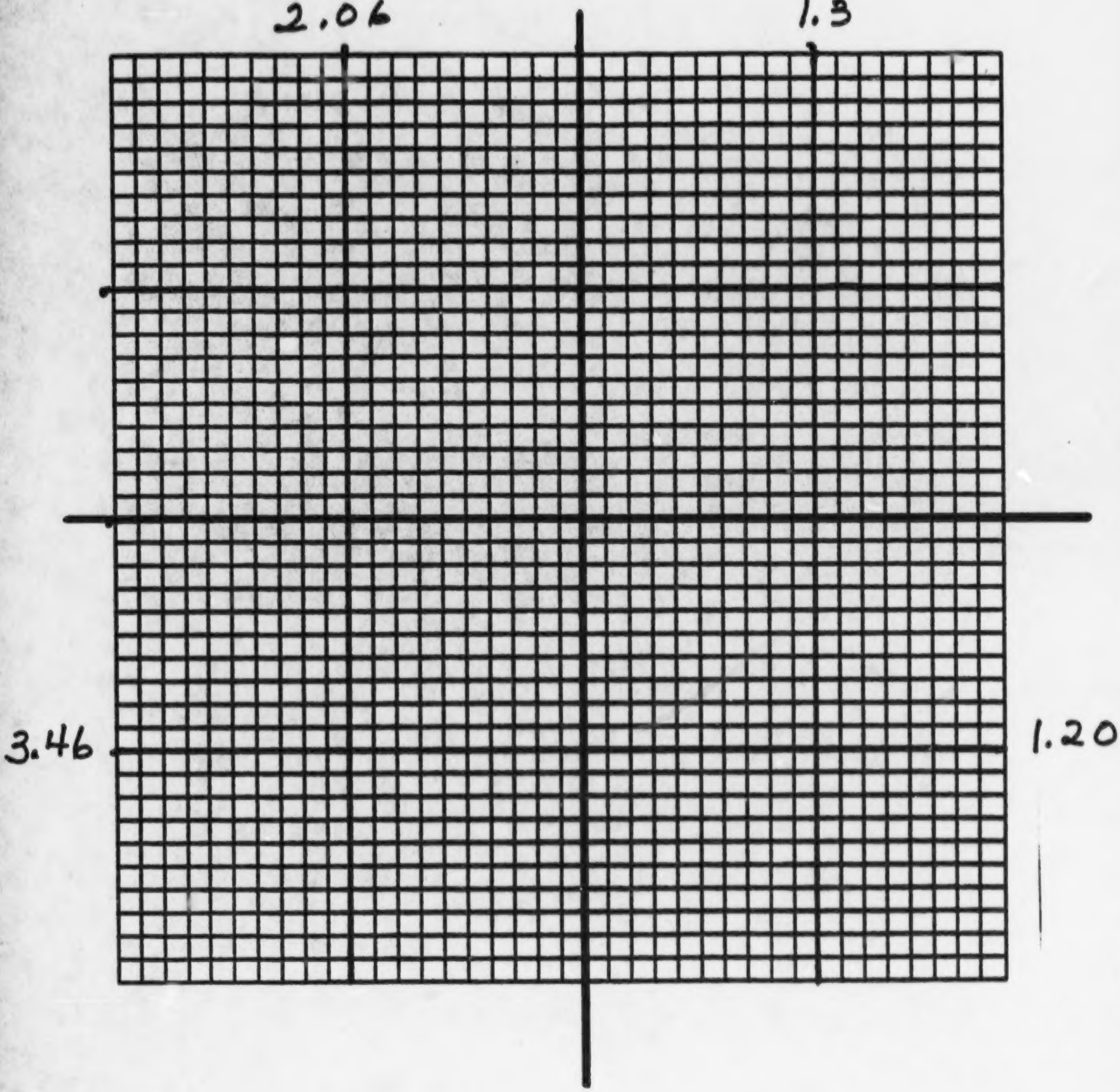
☐ = 9/8 + 7/4

7/6 - 1/2 = ☐

☐ = 7/6 - 2/3

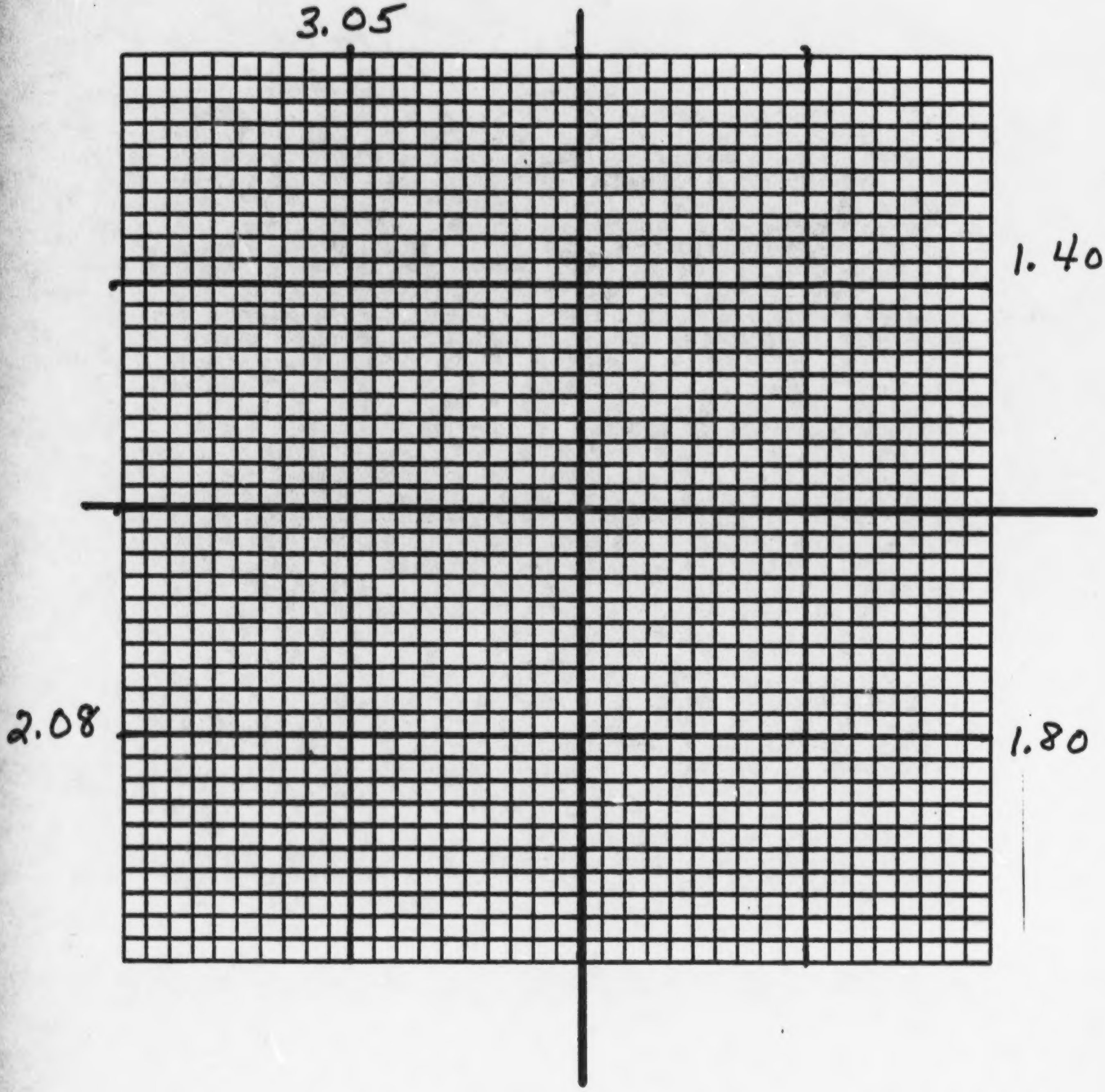
Mathematician: ______________________________

"I shaded in the ONES and parts of ONES to show the decimals."


2.06
1.3
3.46
1.20

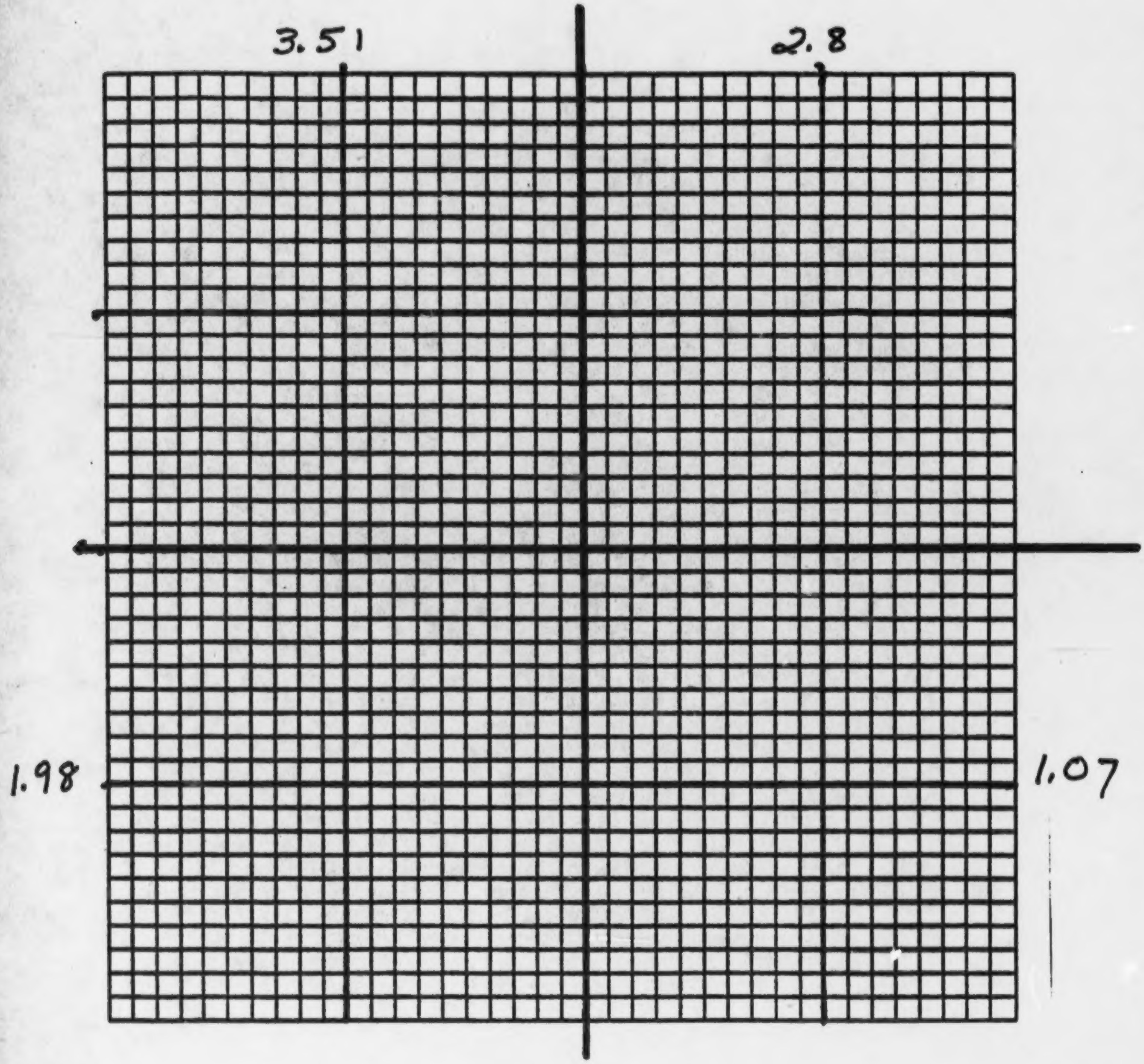
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.05
1.40
2.08
1.80

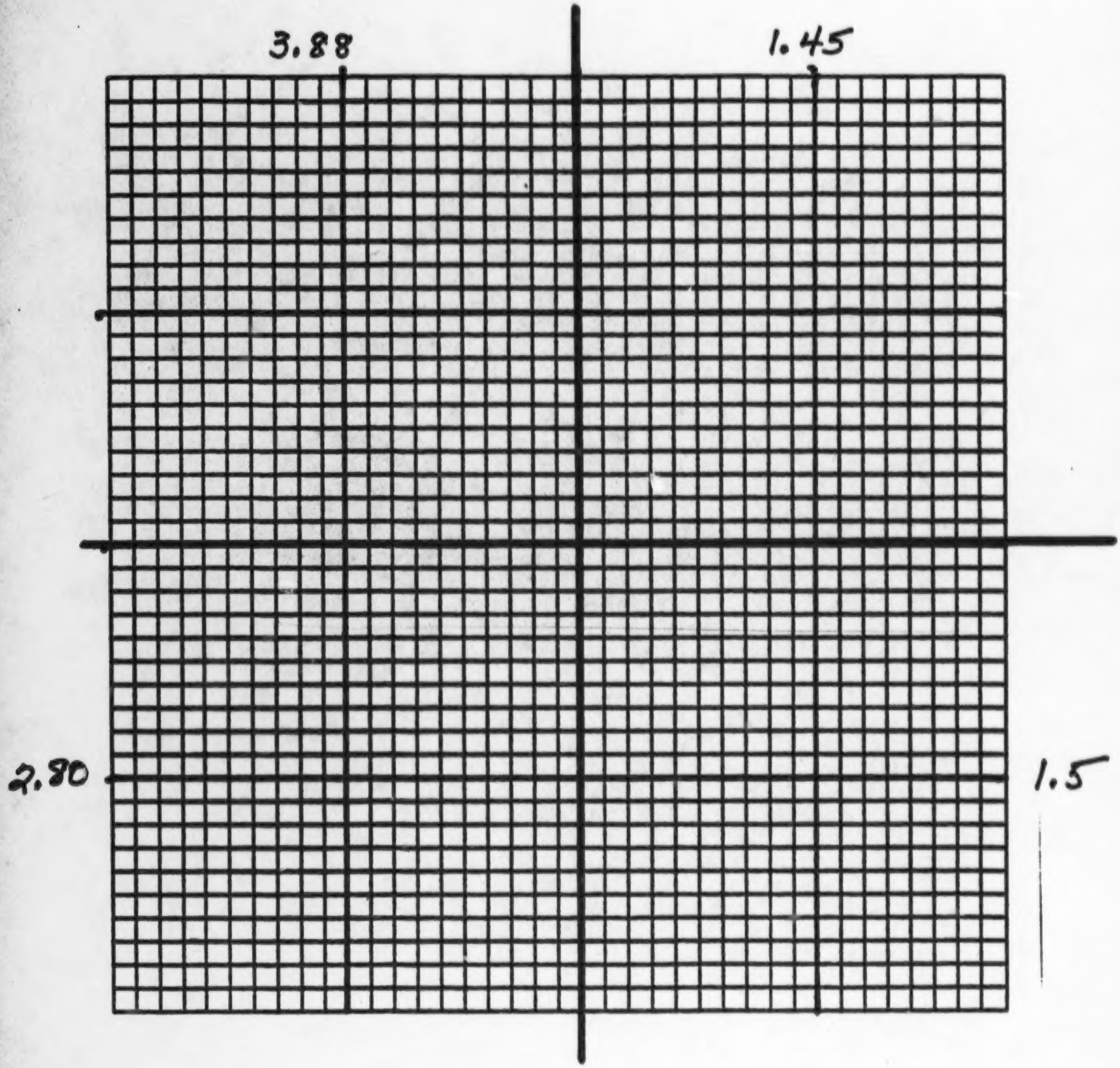
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.51
2.8
1.98
1.07

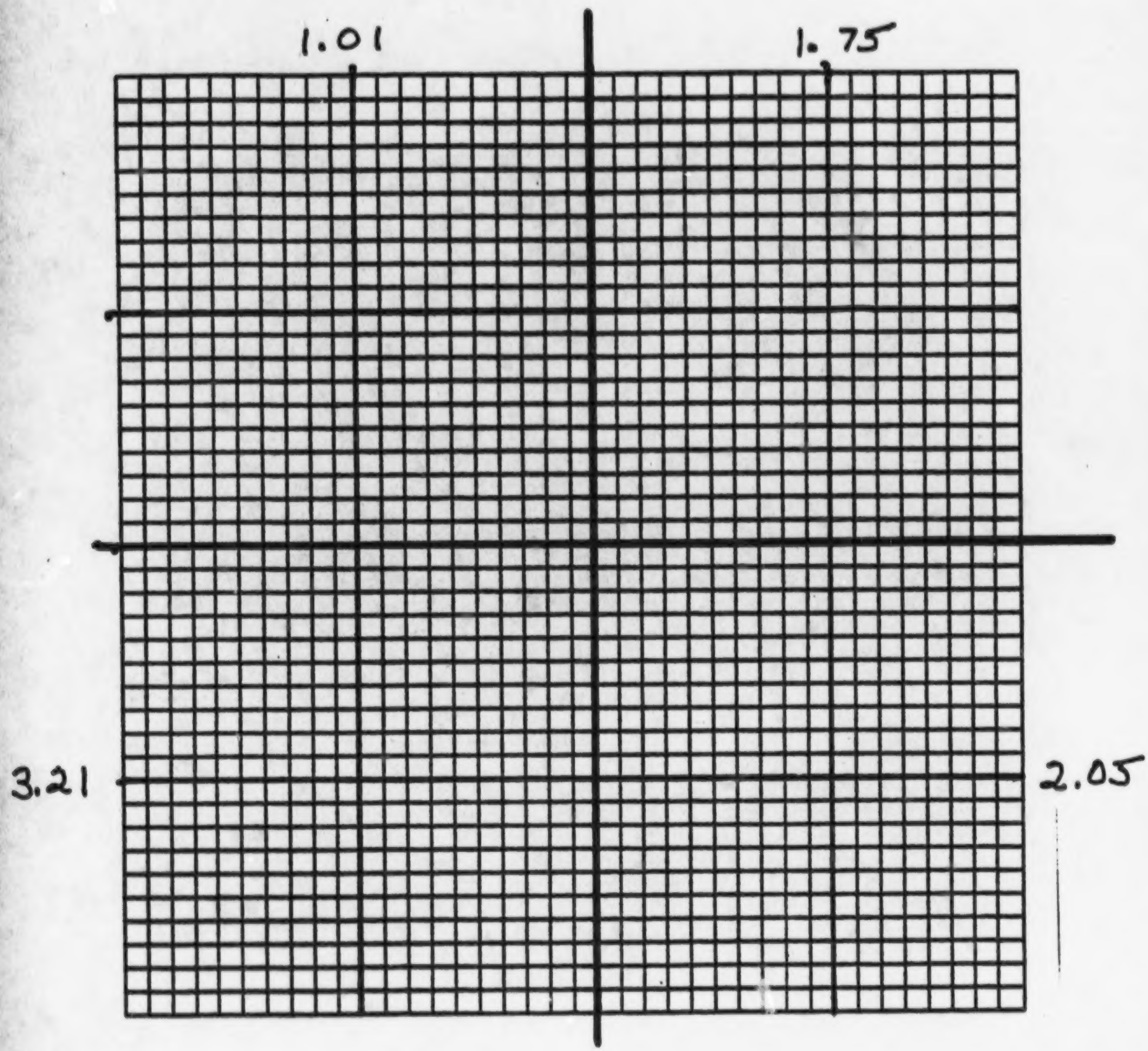
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.88
1.45
2.80
1.5

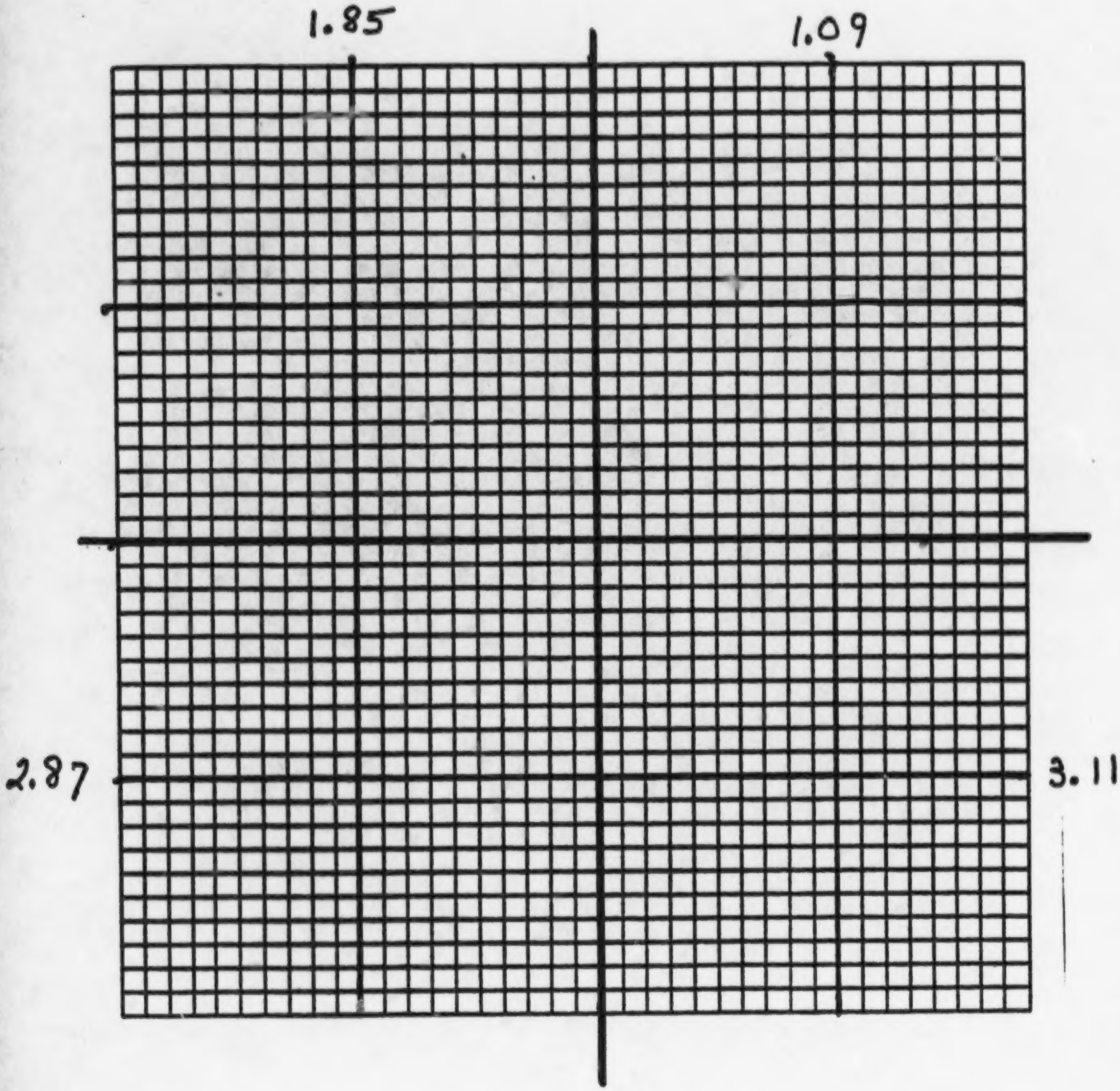
Mathematician:

"I shaded in the ONES and parts of ONES to show the decimals."


1.01
1.75
3.21
2.05

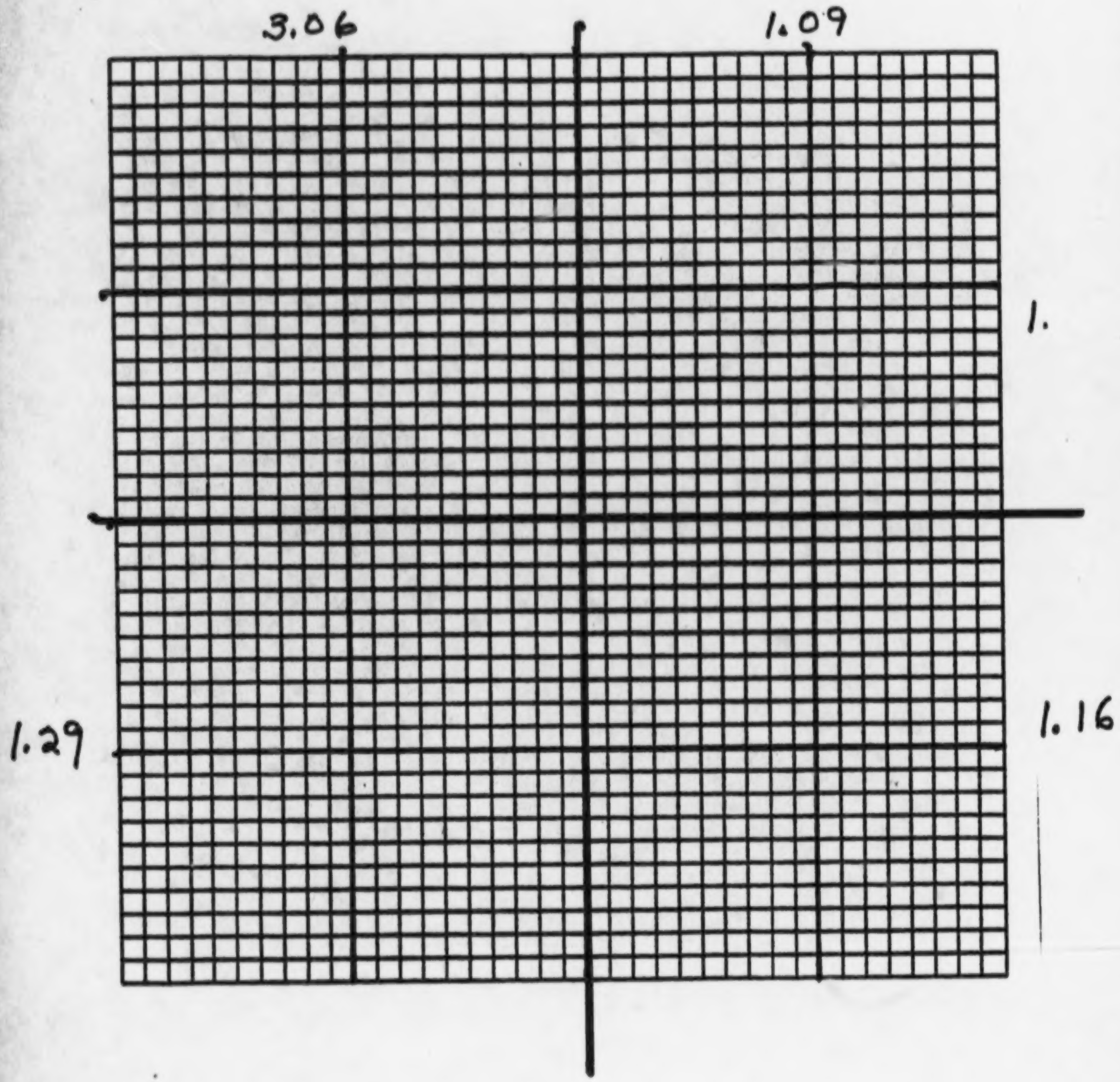
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


1.85
1.09
2.87
3.11

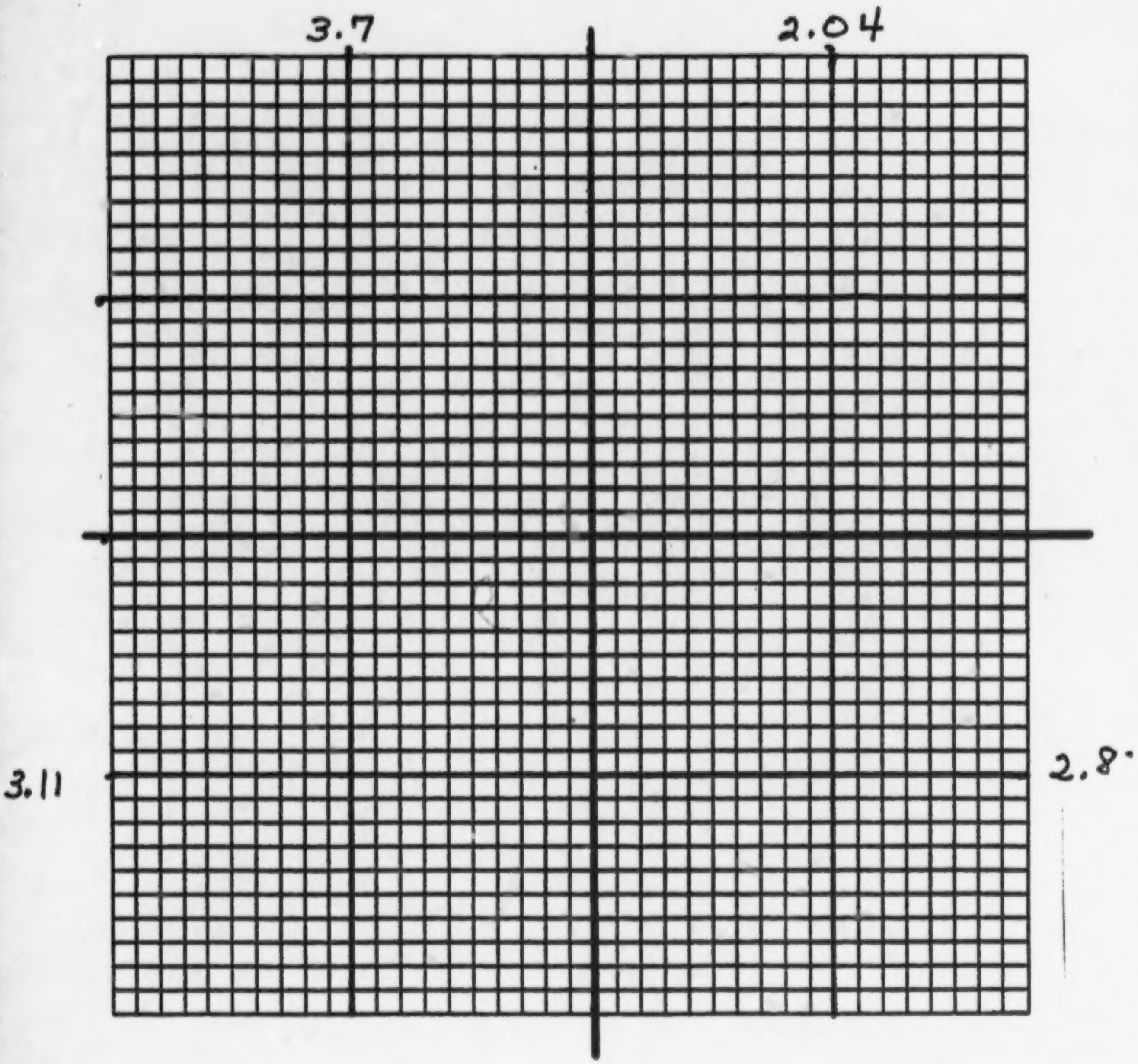
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.06
1.09
1.
1.29
1.16

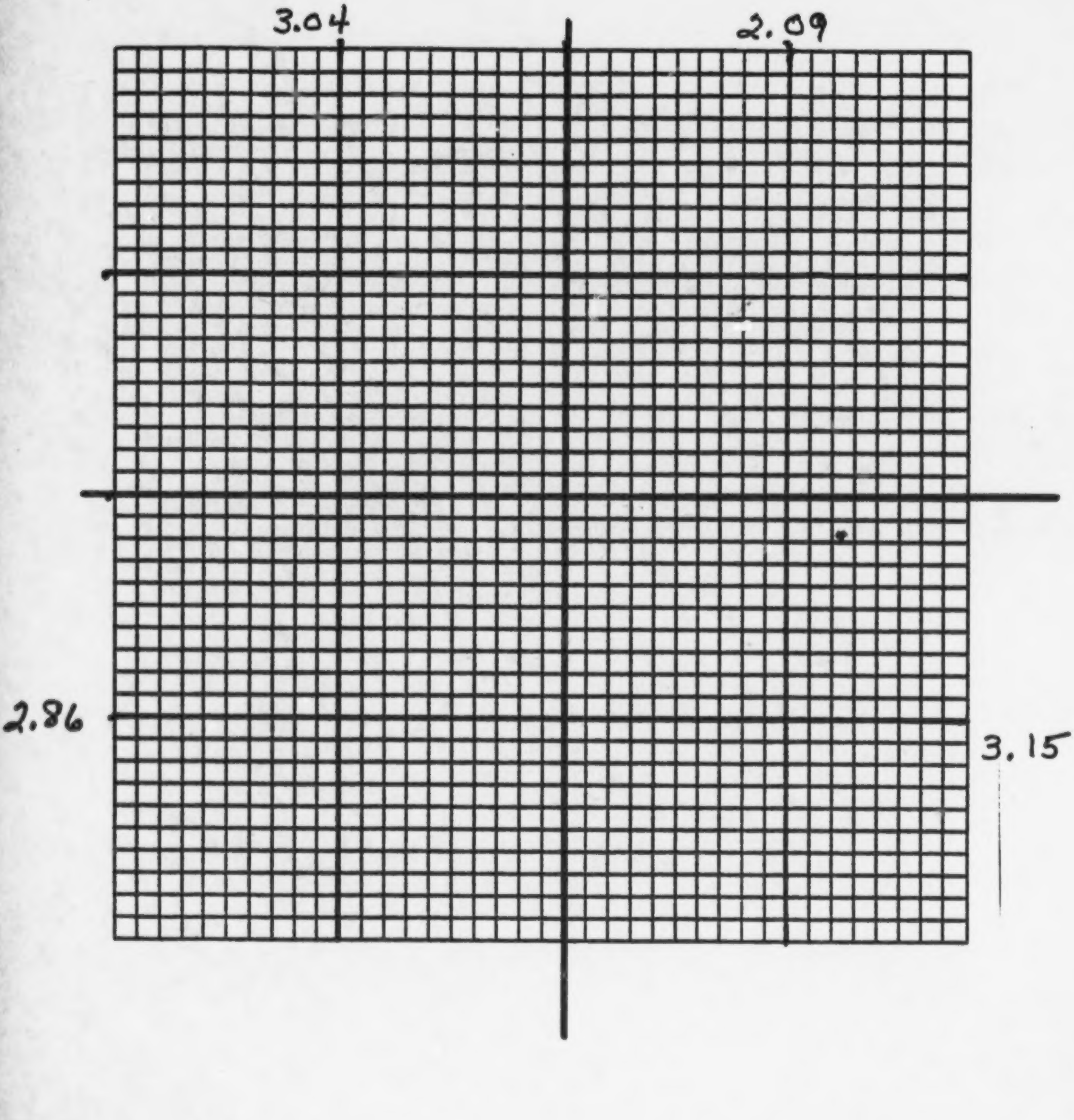
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.7
2.04
3.11
2.8

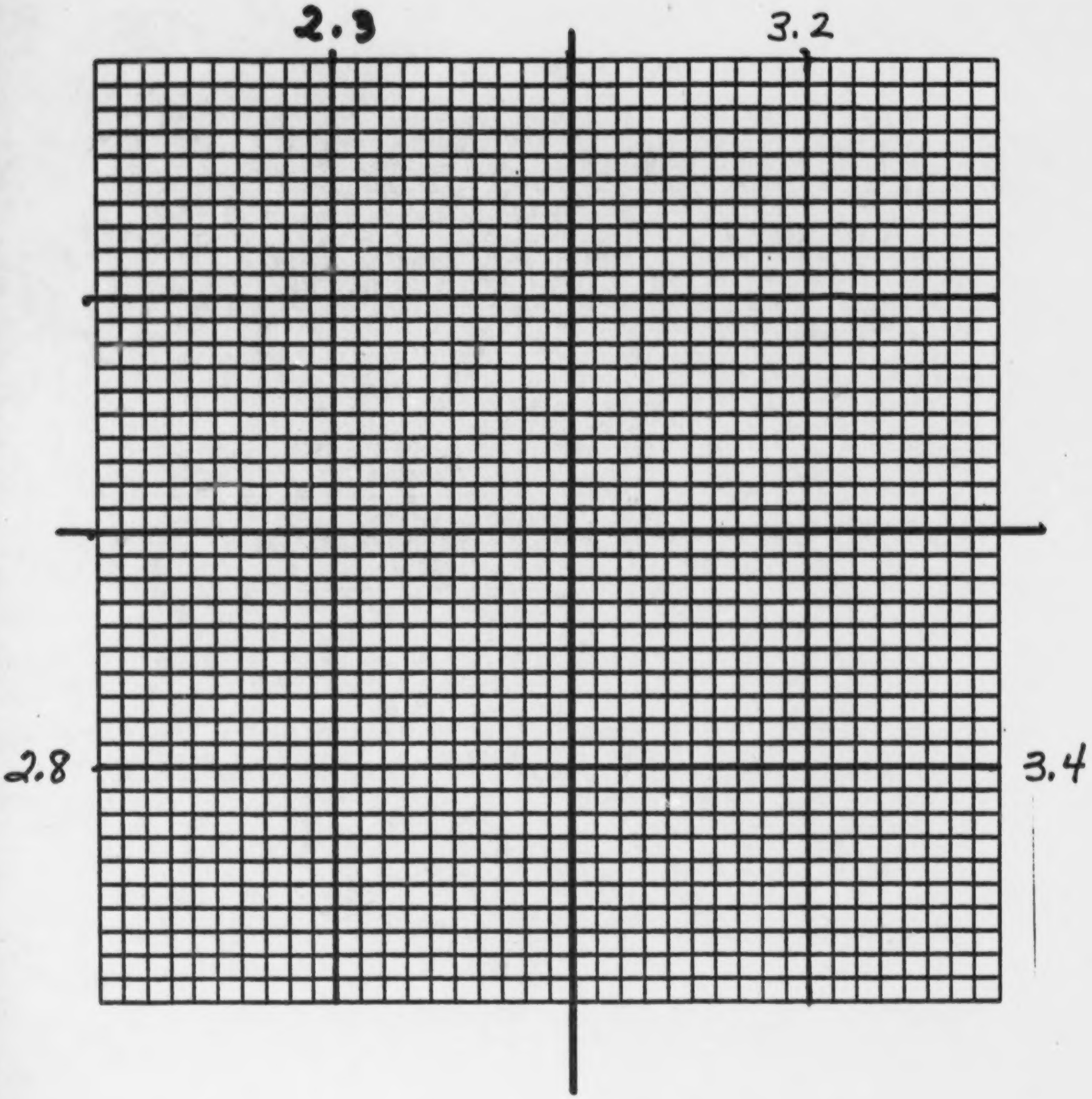
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."


3.04
2.09
2.86
3.15

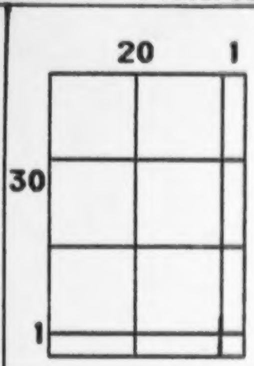
Mathematician:____

"I shaded in the ONES and parts of ONES to show the decimals."



Mathematician:____

"I showed each multiplication in several forms."

Multiplication	**Pictured as a rectangle in expanded form**		**With T for Ten**
Example: 21 x31 600 30 20 1 651		20 + 1 30 + 1 600 + 30 20 + 1 651	$(2T + 1)(3T + 1) =$ $6T^2 + 3T + 3T + 1 =$ $6(100) + 5(10) + 1 =$ 651
18 x18			
32 x18			
27 x27			

11688

COMPUTATION: MULTIPLICATION 1

Mathematician:____

"I showed each multiplication in several forms."

Multiplication	Pictured as a rectangle in expanded form	With T for Ten
17 x25		
20 x 32		
18 x 30		
41 x 32		

11688

Mathematician:____

"I showed each multiplication in several forms."

Multiplication	Pictured as a rectangle in expanded form	With T for Ten
26 x 26		
19 x 41		
23 x 17		
28 x 19		

Mathematician:____

"I showed each multiplication in several forms."

Multiplication	Pictured as a rectangle in expanded form	With T for Ten
32 x32		
27 x 27		
36 x 26		
19 x 52		

Mathematician:____

"I showed each multiplication in several forms."

Multiplication	Pictured as a rectangle in expanded form	With T for Ten
32 x32		
31 x29		
28 x42		
47 x36		

11688

Mathematician:____

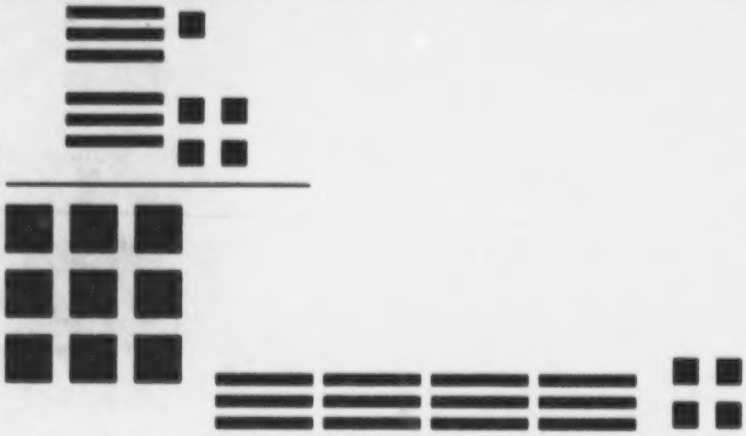
"I showed each multiplication in several forms."

Multiplication	Pictured as a rectangle in expanded form	With T for Ten
15 x45		
32 x32		
16 x48		
14 x41		

11688

Mathematician:____________________________________

"I did the multiplications, drew a picture of the hundreds, ten and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
Example: 31 x34 900 30 120 4 1054		30 + 1 30 + 4 900 + 30 120 + 4 900 + 150 + 4 = 1054
17 x18		
14 x32		

Computation : MULTIPLICATION 2

Mathematician: ______________________________

"I did the multiplications, drew a picture of the hundreds, ten and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
30 x26		
13 x20		
39 x29		

Mathematician:____

"I did the multiplications, drew a picture of the hundreds, ten and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
18 × 18		
26 × 31		
25 × 25		

11788

Mathematician:____

"I did the multiplications, drew a picture of the hundreds, ten and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
46 x27		
32 x56		
31 x31		

11788

Mathematician:____

"I did the multiplications, drew a picture of the hundreds, tens and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
21 x13		
24 x36		
18 x34		

11788

Mathematician:____

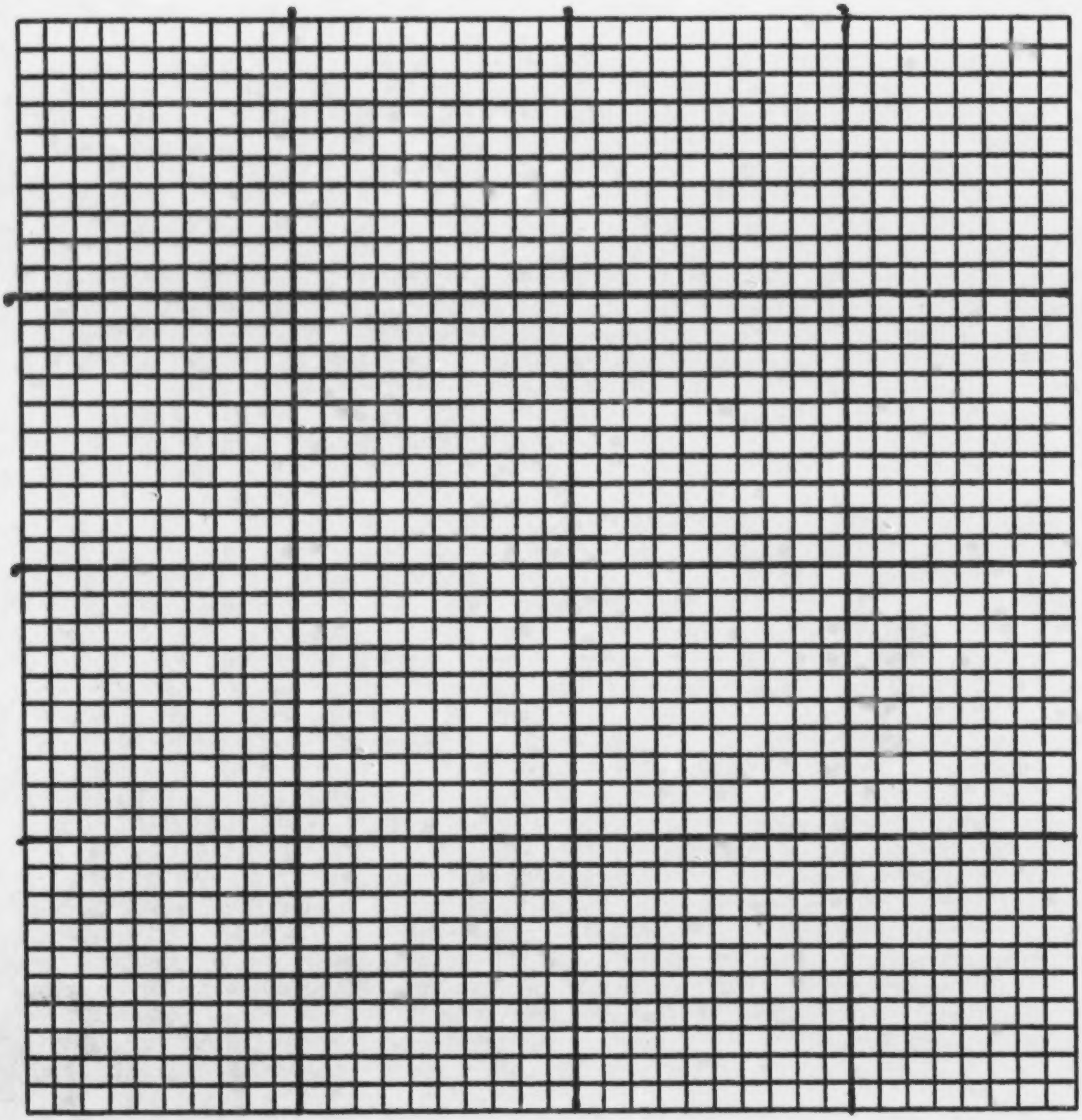
"I did the multiplications, drew a picture of the hundreds, ten and ones, regrouped where needed and completed the computation form."

Multiplication	Base Ten Blocks	Expanded form
21 x 21		
31 x 52		
28 x 47		

Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$26\overline{)394}$



COMPUTATION: DIVISION LESSON THREE

Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$35\overline{)426}$

Mathematician: ______________________________

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$27\overline{)306}$

Mathematician:____

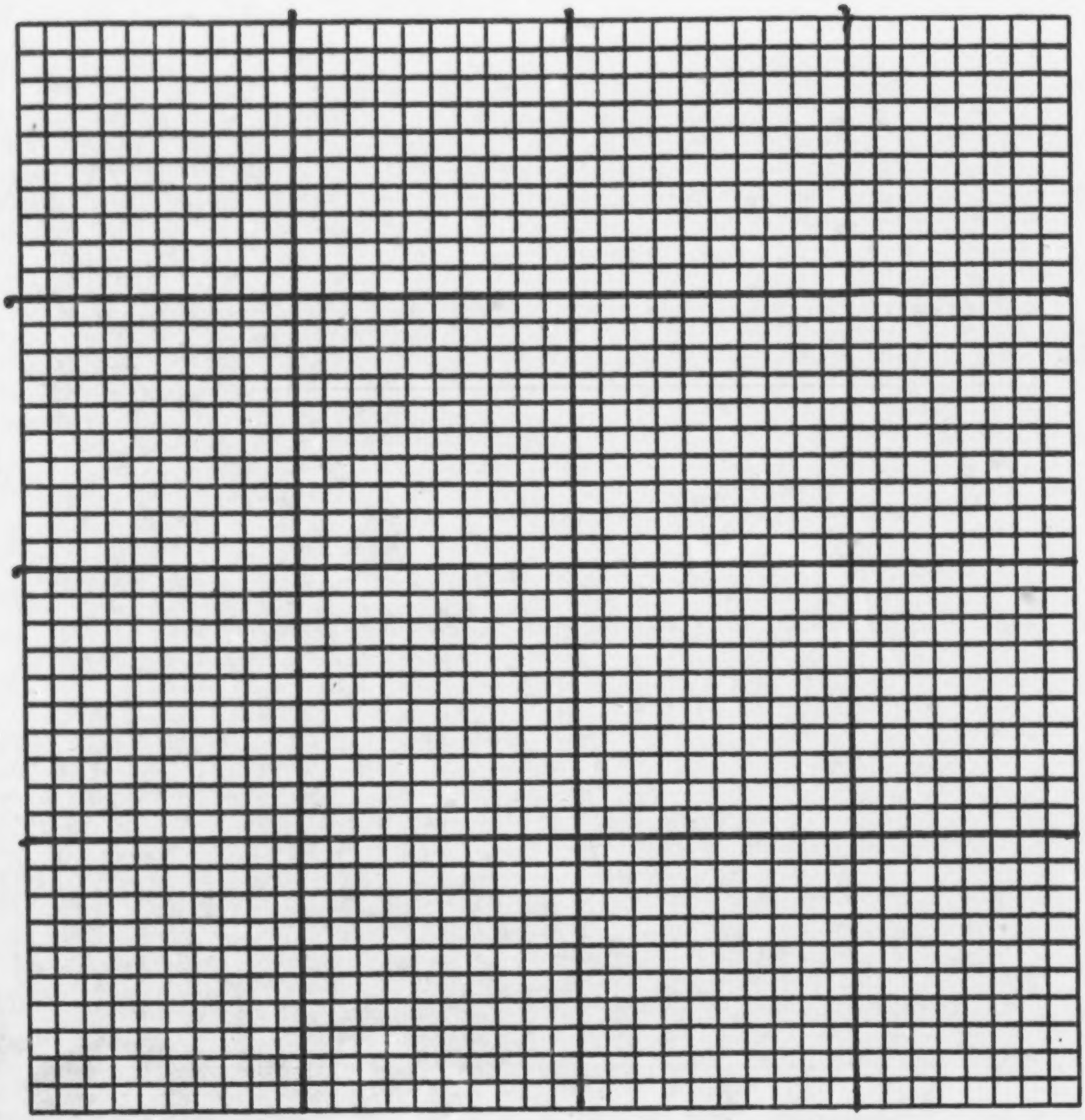
"I did the divisions by making the largest rectangle I could using the divisor as one side."

$31\overline{)287}$

Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

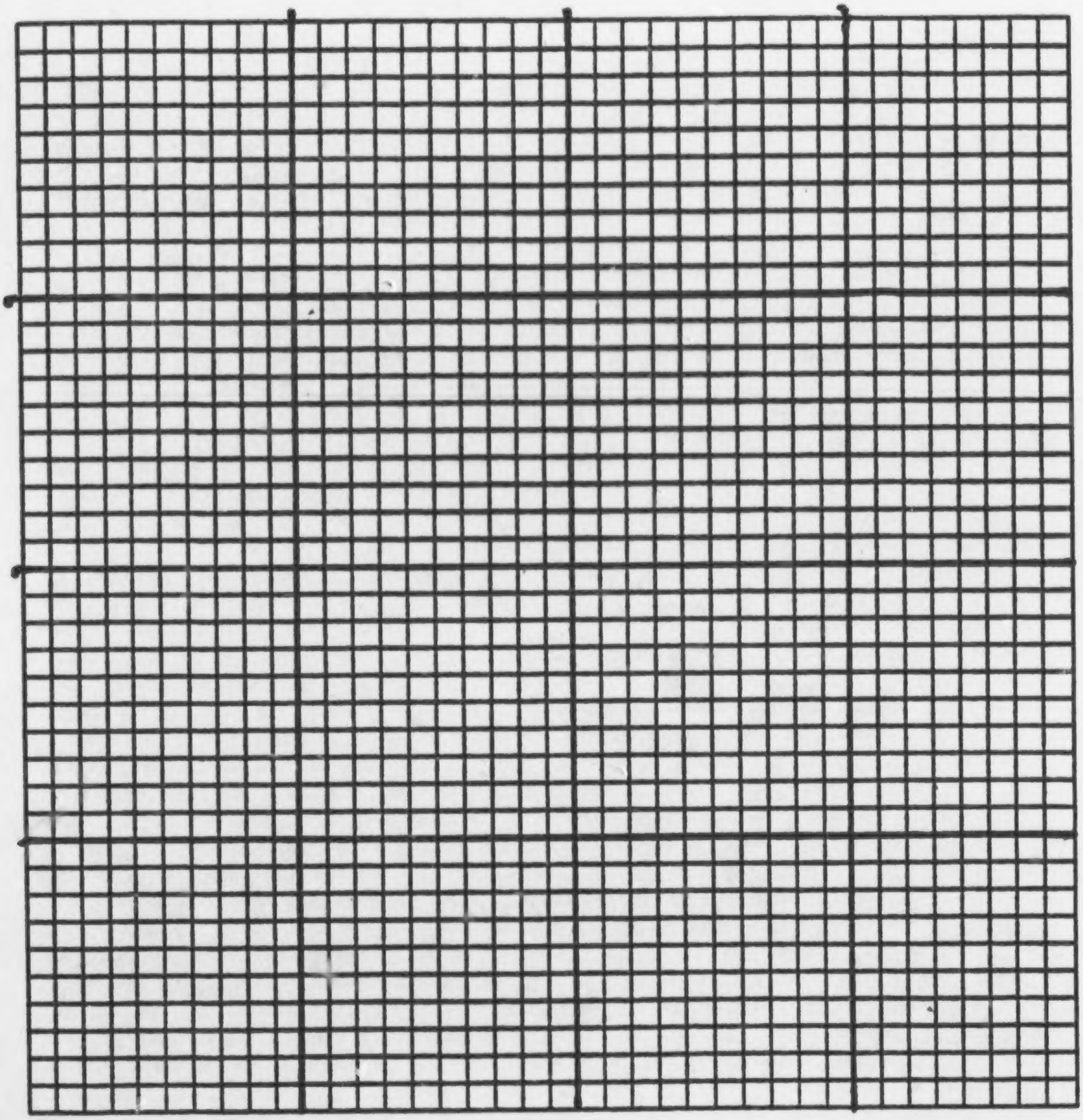
$27\overline{)406}$



Mathematician:______________________________________

"I did the divisions by making the largest rectangle I could using the divisor as one side."

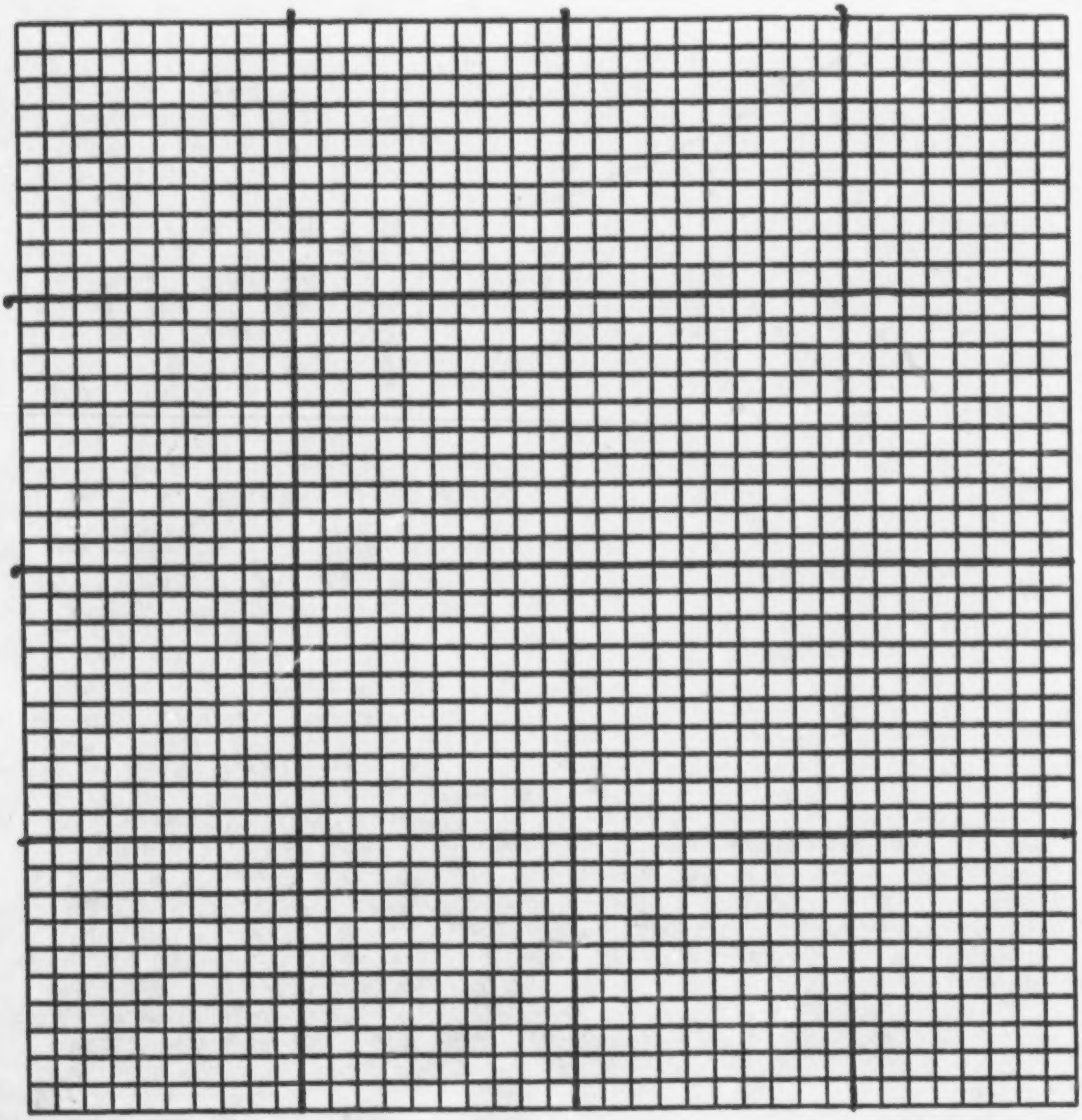
290 ÷ 25 =



Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$368 \div 26 =$



Mathematician:________________________________

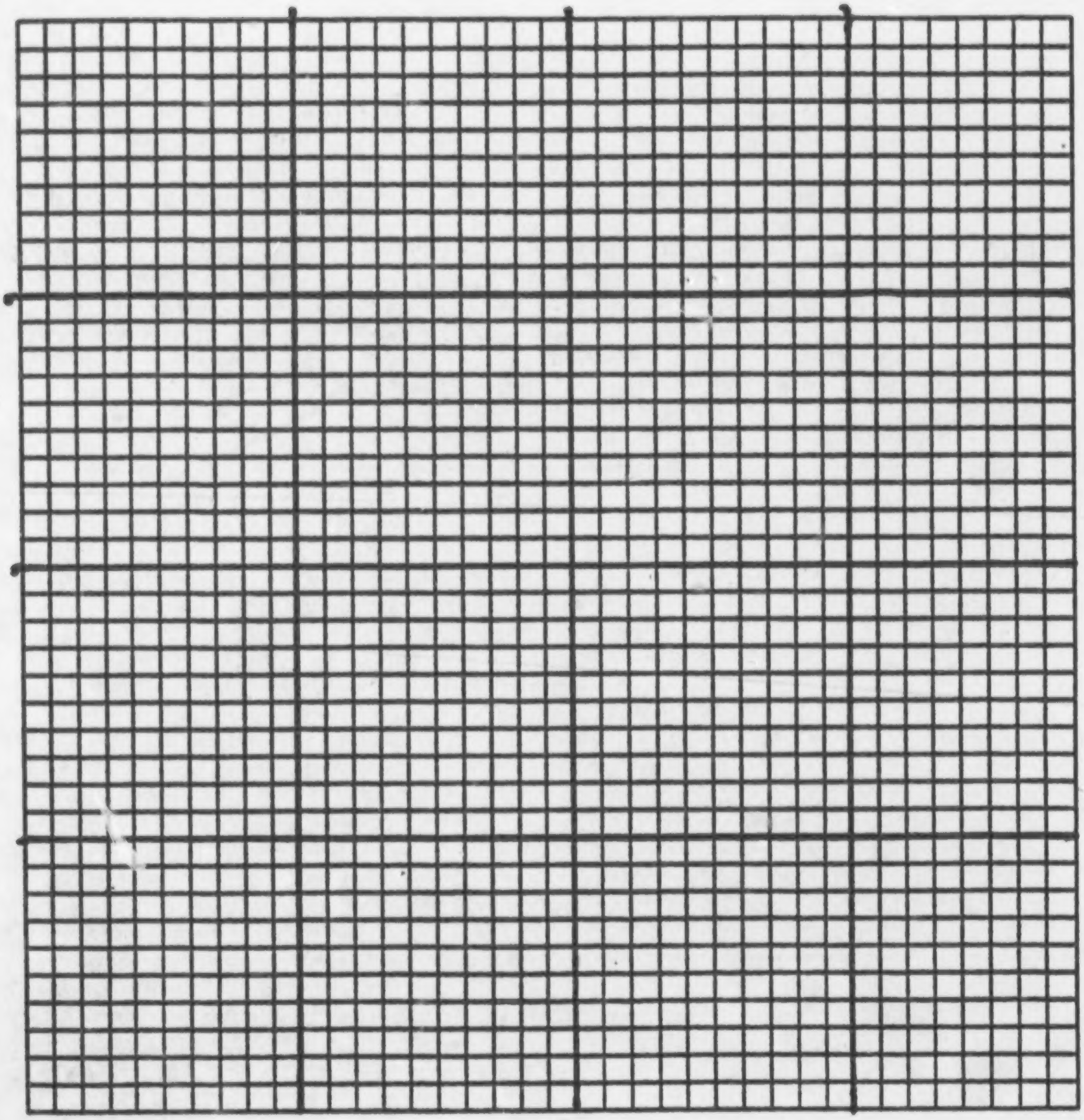
"I did the divisions by making the largest rectangle I could using the divisor as one side."

$289 \div 32 =$

Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$327 \div 31 =$



Mathematician:____

"I did the divisions by making the largest rectangle I could using the divisor as one side."

$104 \div 26 =$

Mathematician:____

"I used base ten blocks to do the HORIZONTAL multiplications. I recorded the partial products found."

MULTIPLICATION	FINDING THE FOUR PARTIAL PRODUCTS	FINAL PRODUCT
EXAMPLE: 15 × 23	1. 200 2. 100 3. 30 4. 15 Total: 345	345
21 × 18	1. 2. 3. 4. Total:	
32 × 22	1. 2. 3. 4. Total:	
27 × 31	1. 2. 3. 4. Total:	
25 × 35		6.12.89.4

Mathematician:____

"I used base ten blocks to do the HORIZONTAL multiplications. I recorded the partial products found."

MULTIPLICATION	FINDING THE FOUR PARTIAL PRODUCTS	FINAL PRODUCT
18 x 18	1. 2. 3. 4. Total:	
22 x 36	1. 2. 3. 4. Total:	
24 x 47	1. 2. 3. 4. Total:	
15 x 33	1. 2. 3. 4. Total:	
16 x 28		6.12.89.4

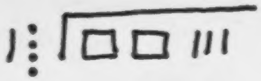
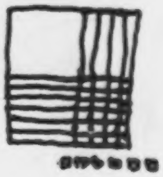
Mathematician:____

"I used base ten blocks to do the HORIZONTAL multiplications. I recorded the partial products found."

MULTIPLICATION	FINDING THE FOUR PARTIAL PRODUCTS	FINAL PRODUCT
42 x 17	1. 2. 3. 4. Total:	
29 x 19	1. 2. 3. 4. Total:	
45 x 25	1. 2. 3. 4. Total:	
51 x 23	1. 2. 3. 4. Total:	
62 x 14		

Mathematician:____

"I did these divisions by places, using base ten blocks. I put the base ten blocks into a rectangle as I subtracted them in the division."

DIVISION	PICTURE	ANSWER
230 ÷ 14	 	230 ÷ 14 = 16R6
158 ÷ 16		
192 ÷ 15		
243 ÷ 11		
254 ÷ 18		

Mathematician: ______________________________

"I did these divisions by places, using base ten blocks. I put the base ten blocks into a rectangle as I subtracted them in the division."

DIVISION	PICTURE	ANSWER
193 ÷ 17		
344 ÷ 21		
286 ÷ 16		
362 ÷ 21		
362 ÷ 22		

Mathematician:____

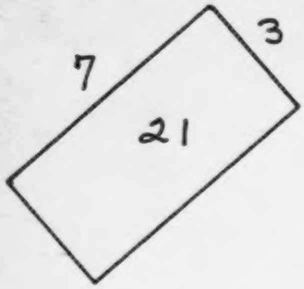
"I did these divisions by places, using base ten blocks. I put the base ten blocks into a rectangle as I subtracted them in the division."

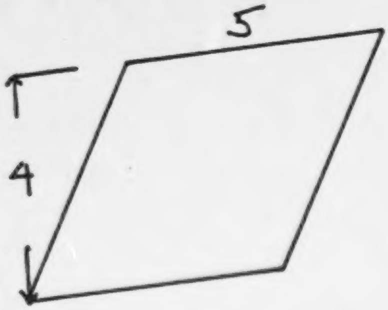
DIVISION	PICTURE	ANSWER
153 ÷ 11		
284 ÷ 16		
147 ÷ 16		
321 ÷ 21		
304 ÷ 15		

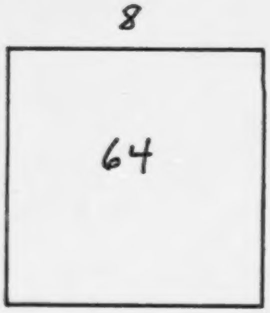
Mathematician:____

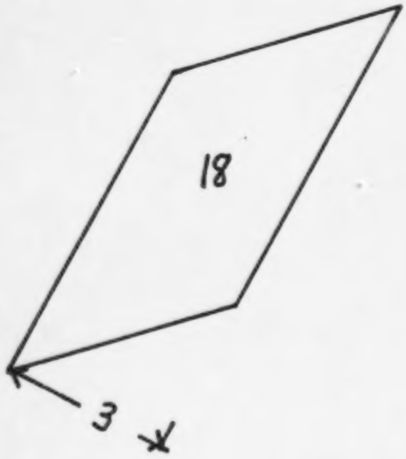
"I found the AREAS or missing parts of these rectangles and parallelograms.
I wrote the AREA INSIDE and labelled the missing parts.

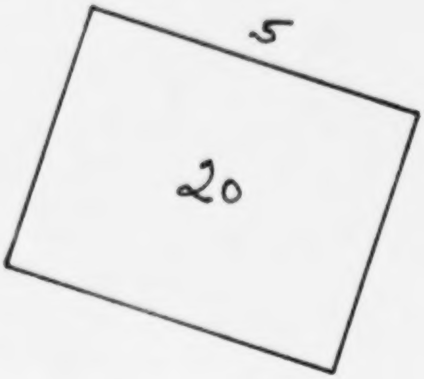
Example:

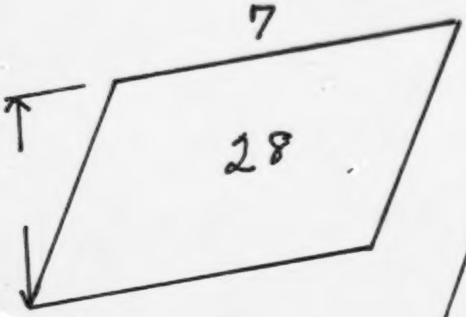


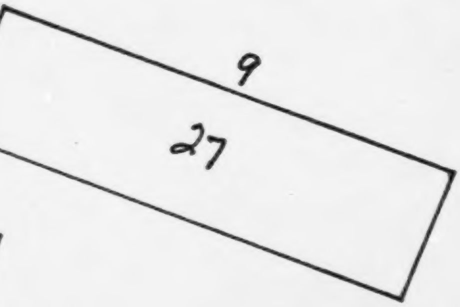


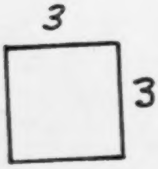


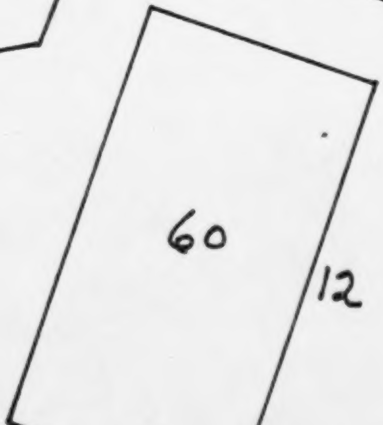


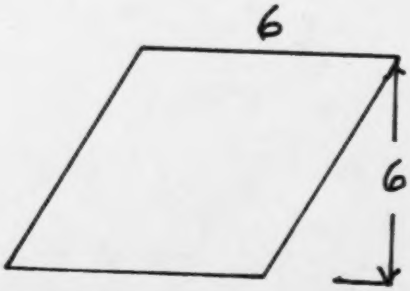






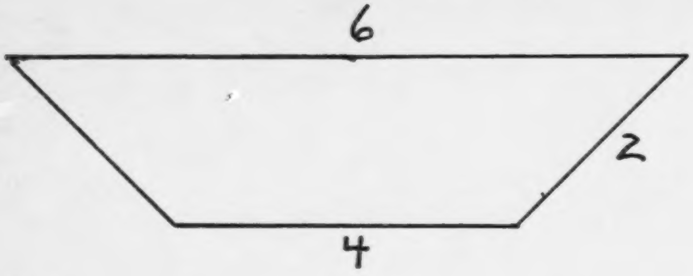




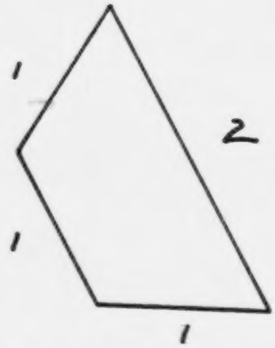


Mathematician:____

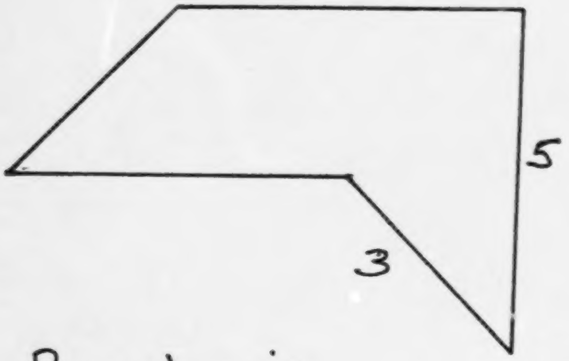
"I found the PERIMETERS for these shapes."



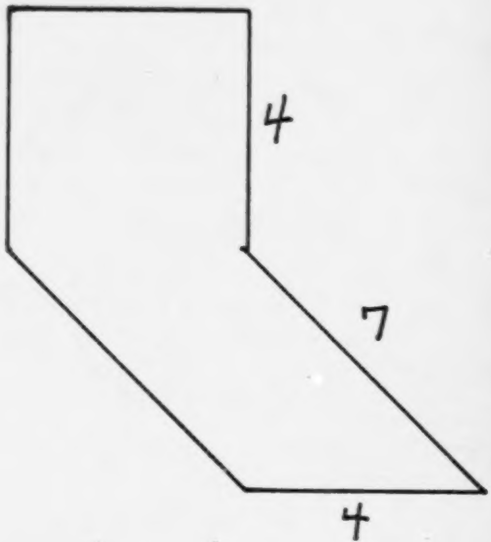
Perimeter is



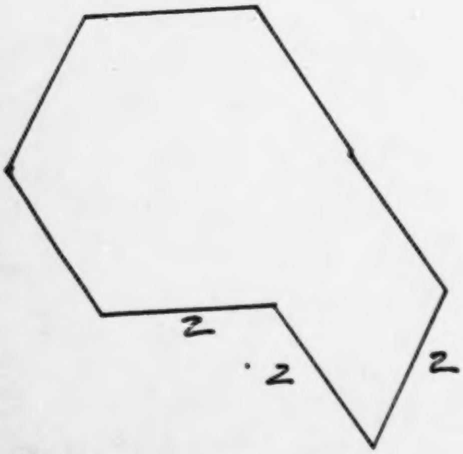
Perimeter is



Perimeter is



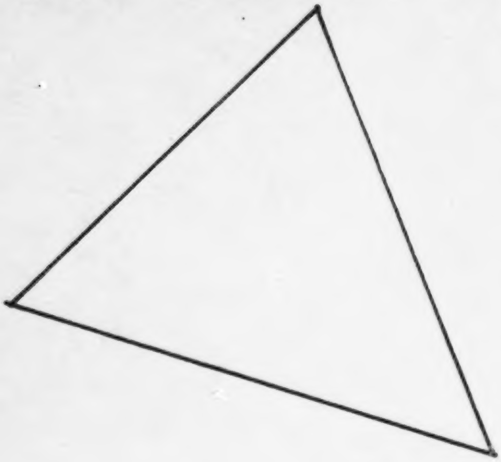
Perimeter is

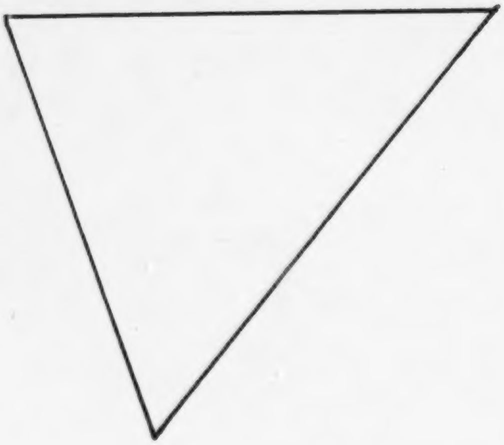


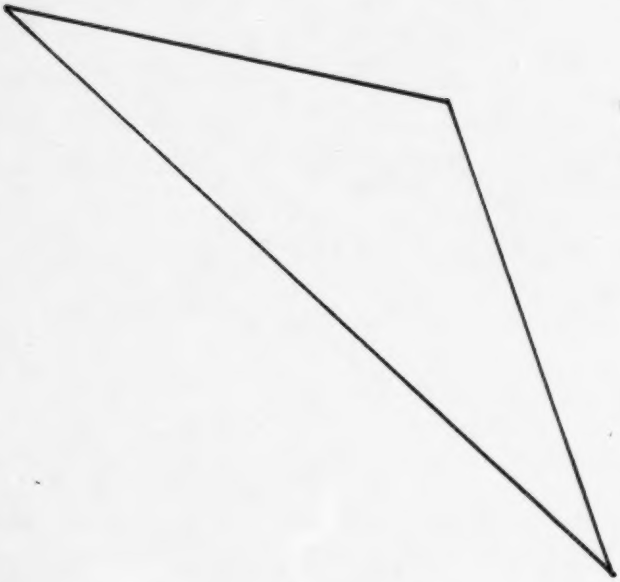
Perimeter is

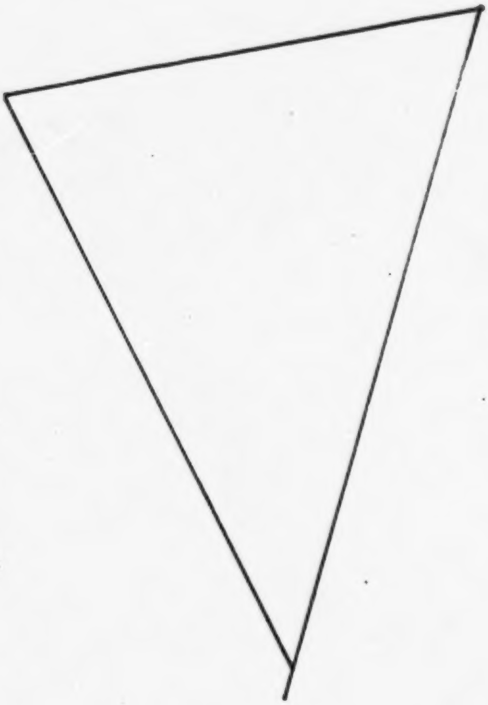
Mathematician:____

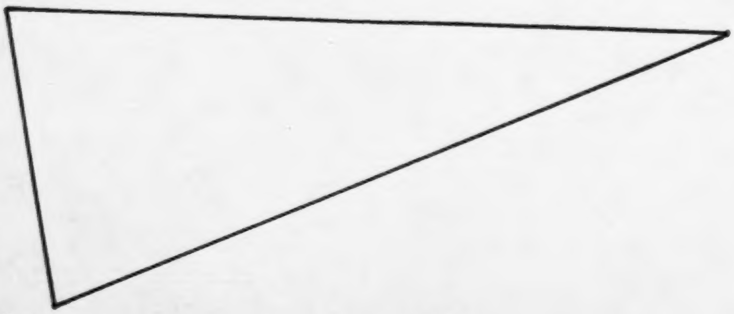
"I used the graph paper transparency to find the areas of these triangles."





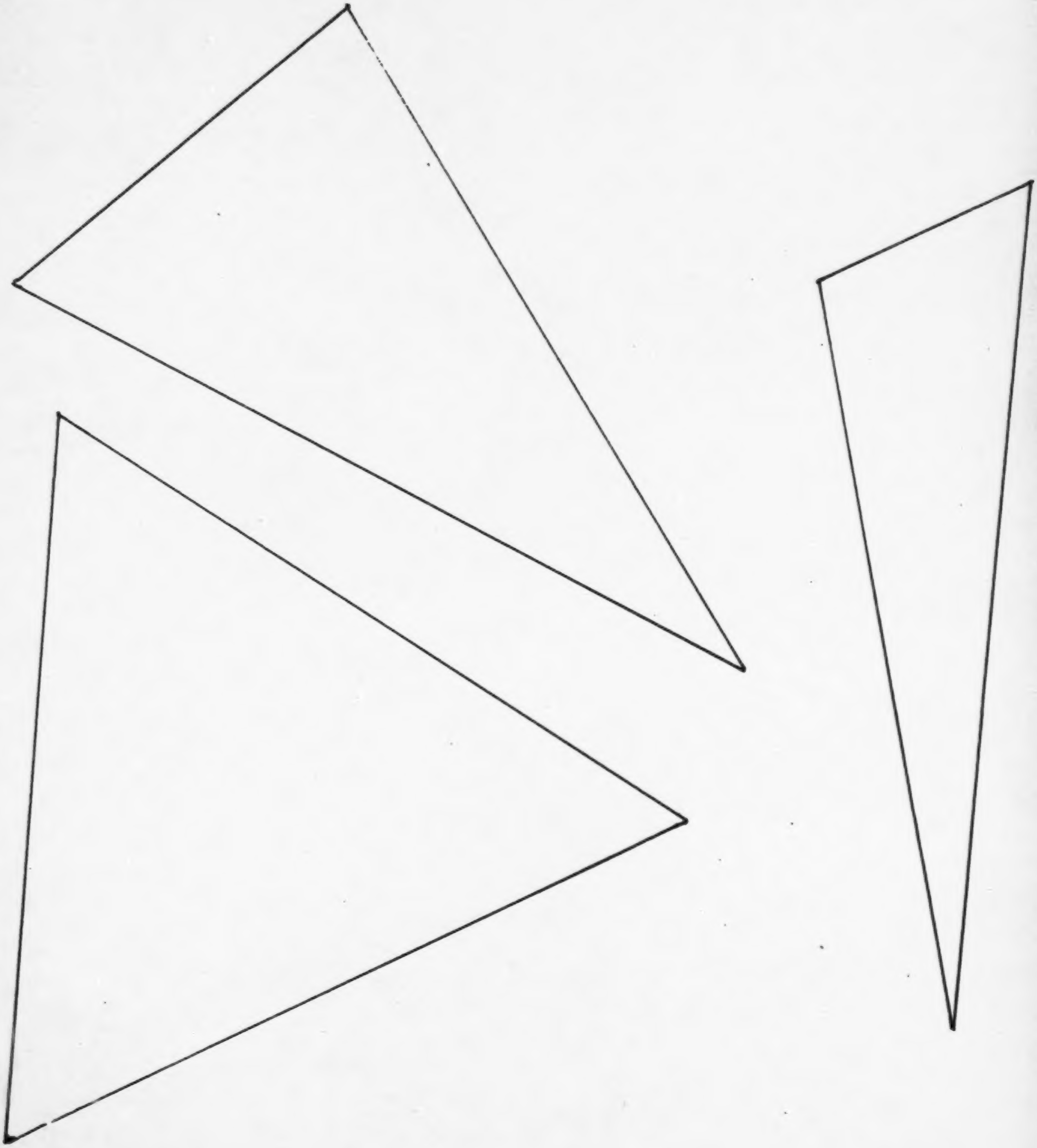






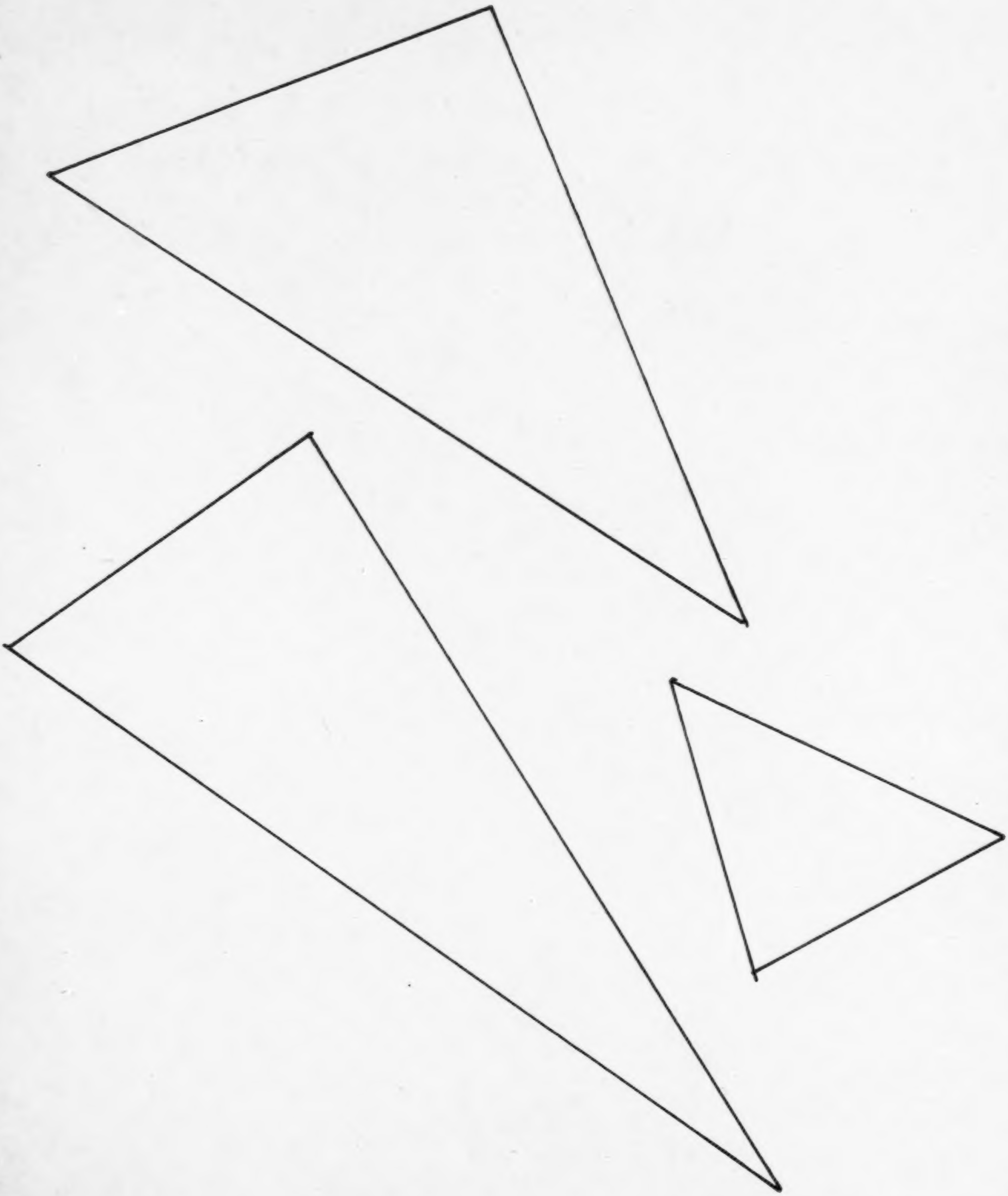
Mathematician:____

"I used the graph paper transparency to find the areas of these triangles."



Mathematician: ______________________________

"I used the graph paper transparency to find the areas of these triangles."

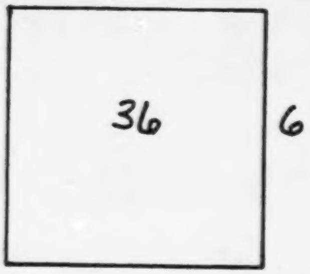


6.12.89.5

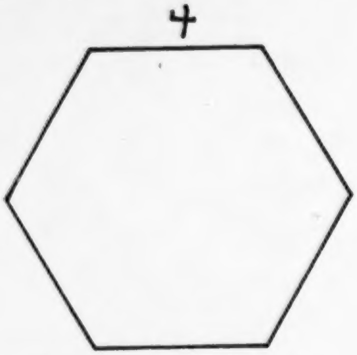
Mathematician:____

"I found the PERIMETERS for these shapes."

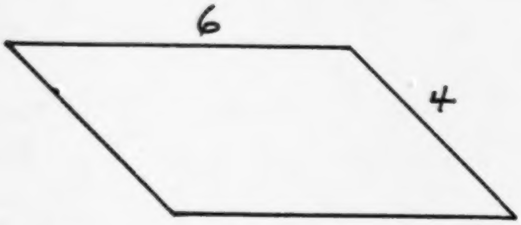
Example:



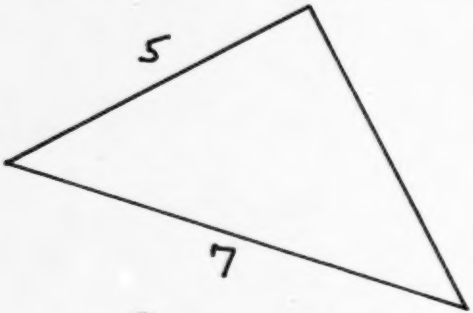
Perimeter is 24



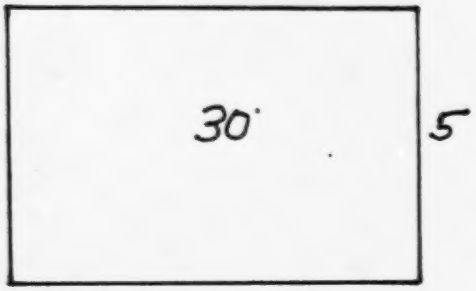
Perimeter is



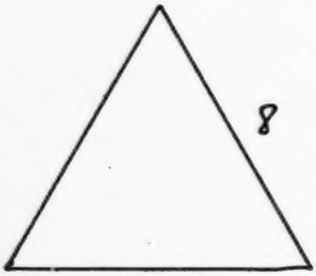
Perimeter is



Perimeter is



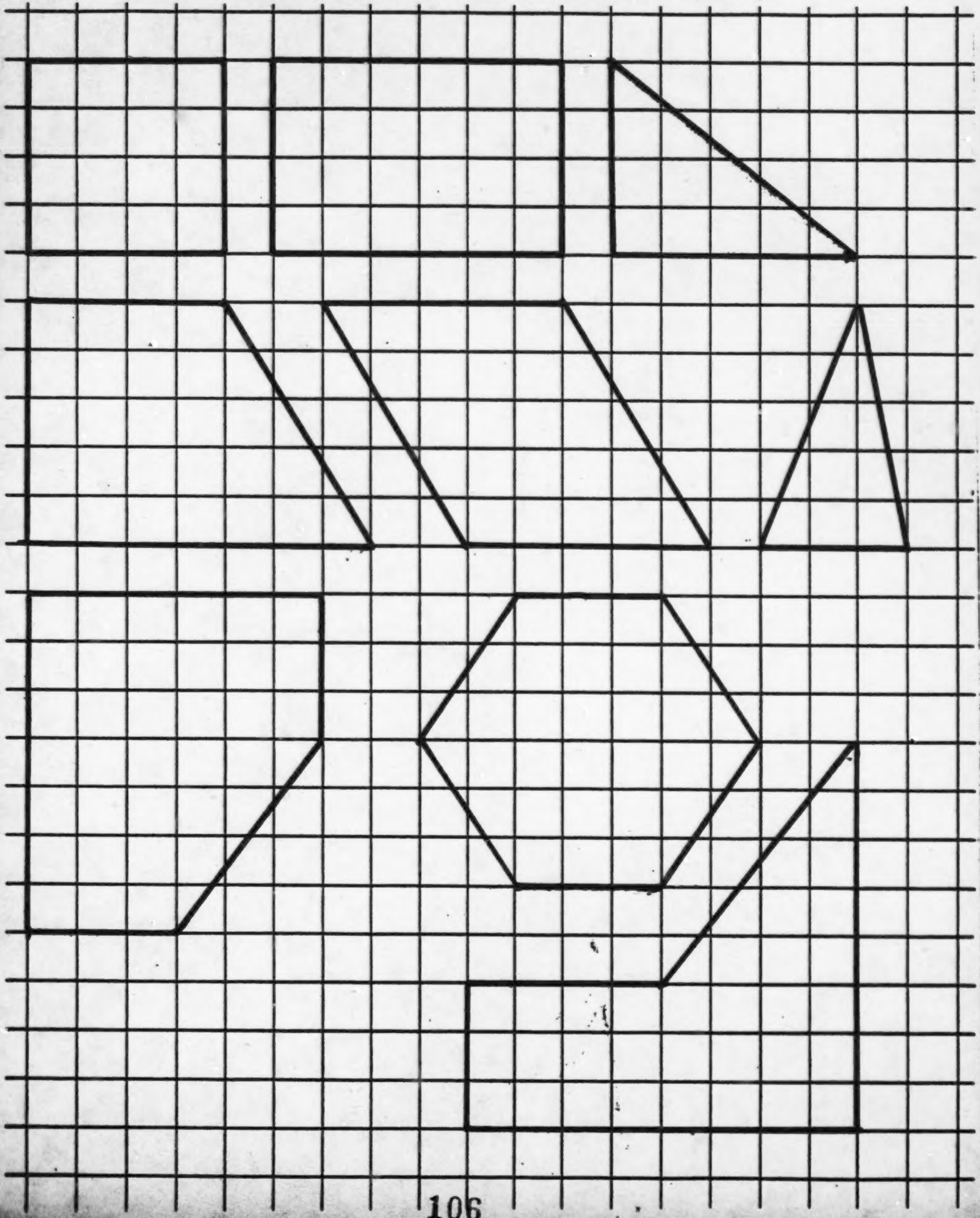
Perimeter is



Perimeter is

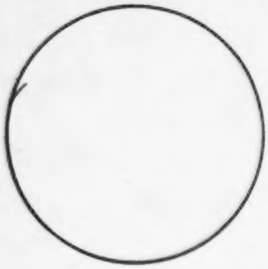
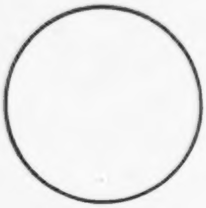
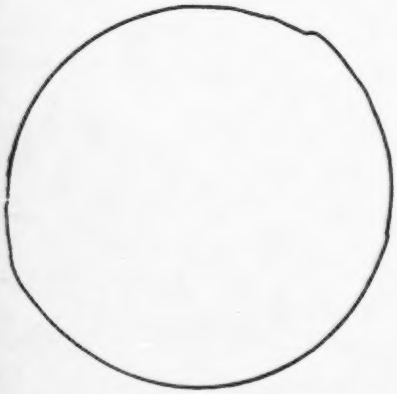
Mathematician:____

"I used the graph paper squares to find the areas of these shapes."



Mathematician:____

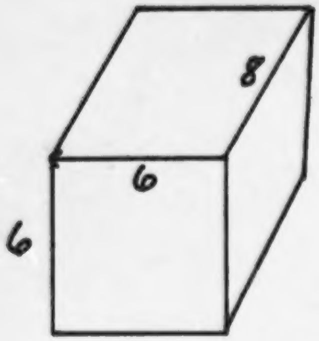
"I used the graph paper transparency to find A, d and C. I completed the table."

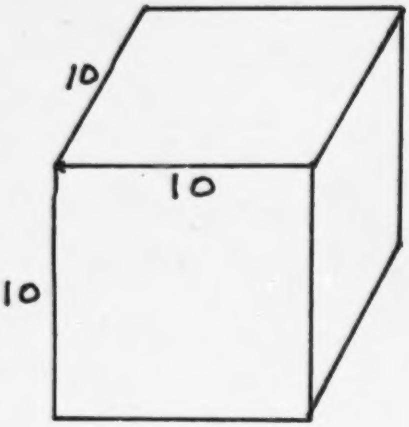
Circle	A	d	C	CD ÷ A
				
				
				

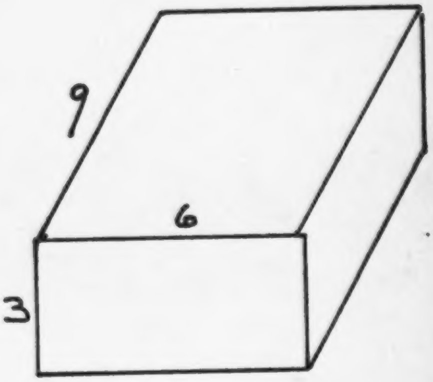
111088

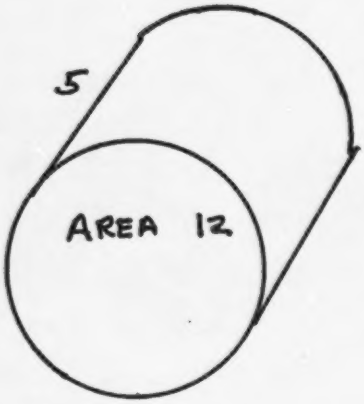
MATHEMATICIAN:____

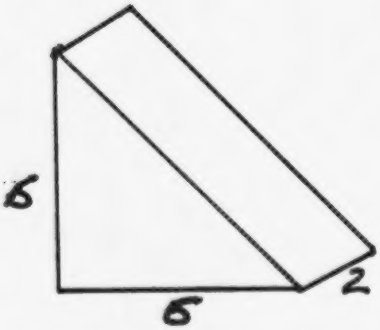
"I found the volume of the shapes pictured and for those with just the dimensions given."

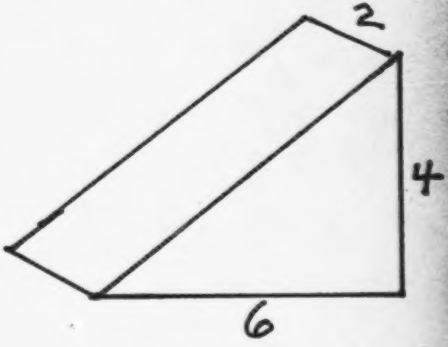












Faces all Rectangles

length 10
width 3
height 2
Volume __

length 8
width 4
height 3
Volume __

length 6
width 5
height 2
Volume __

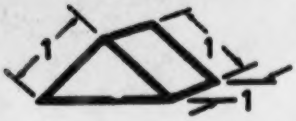
Two opposite faces triangles others rectangles

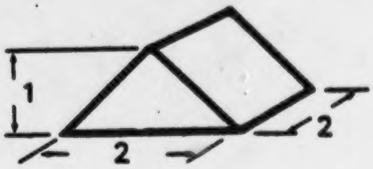
length 10
width 3
height 2
Volume __

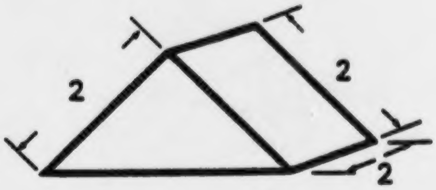
length 6
width 6
height 2
Volume __

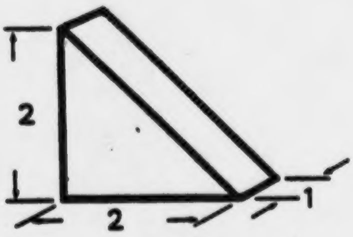
length 8
width 5
height 3
Volume __

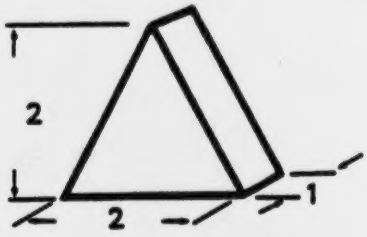
TRIANGULAR PRISMS

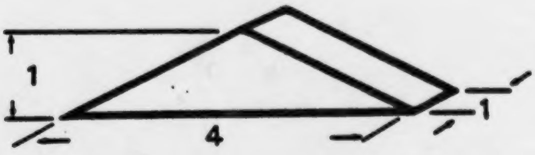


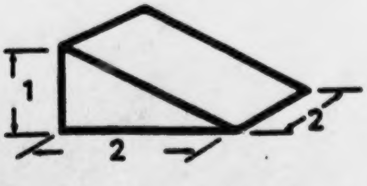


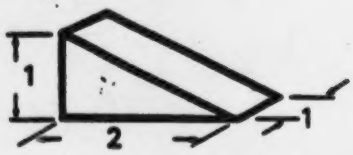


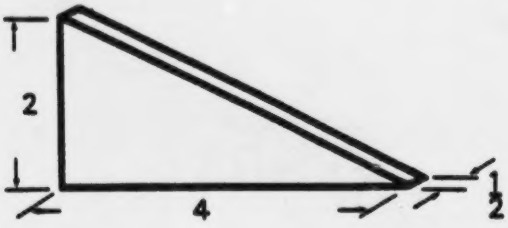


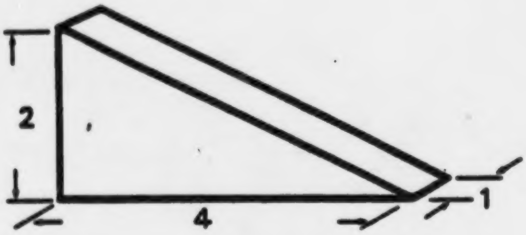


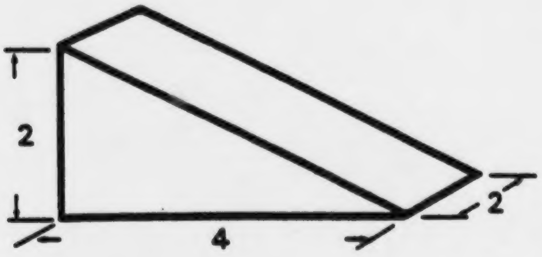


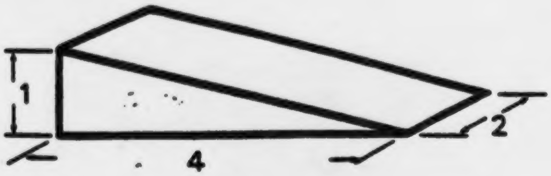


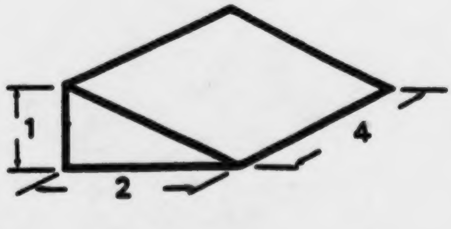




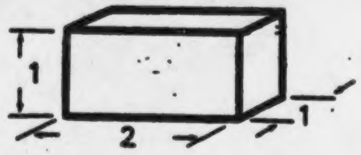


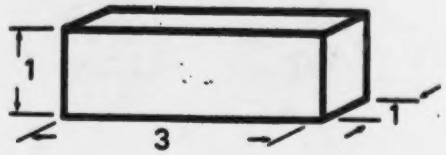


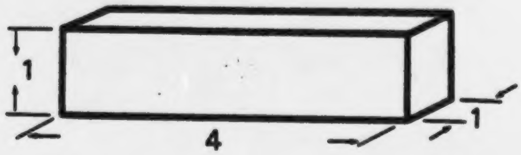


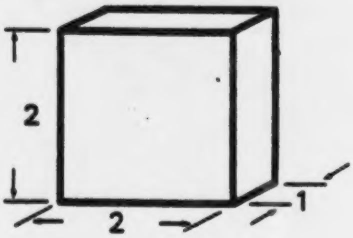


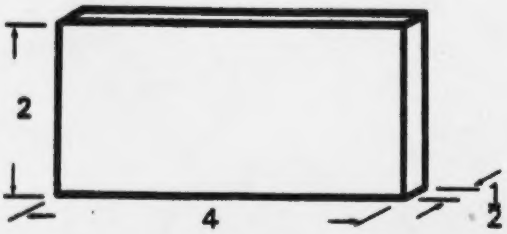
RECTANGULAR PRISMS

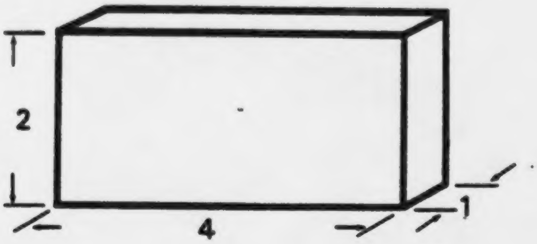


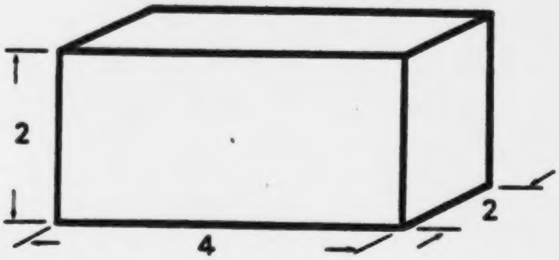


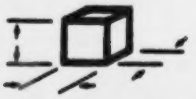




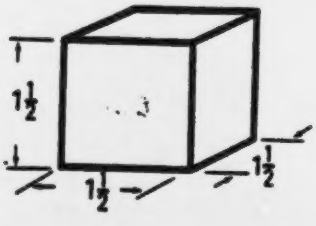


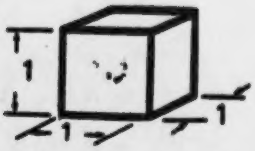


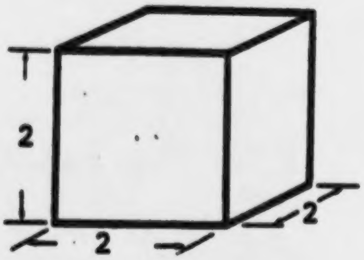




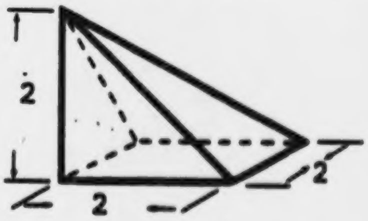
C-1 ½ × ½ × ½





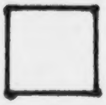


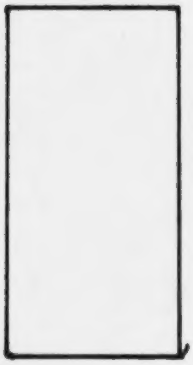
PYRAMID

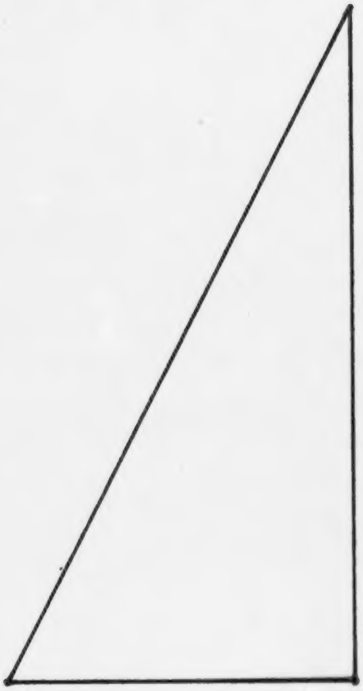


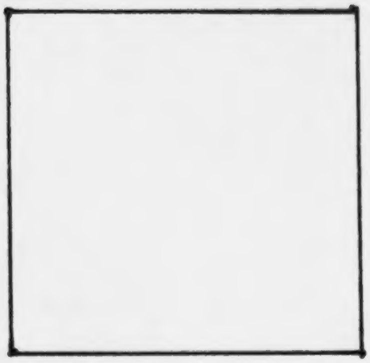
Mathematician:____

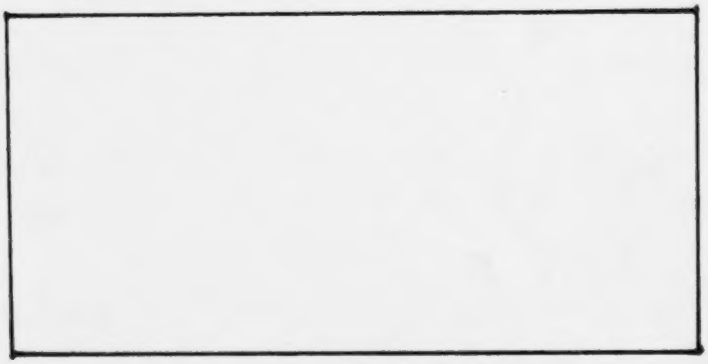
"I covered each shape given with one geoblock that fit."





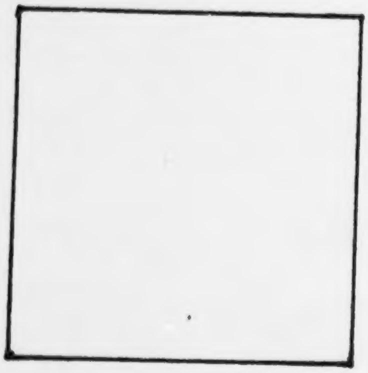


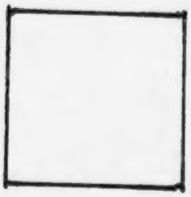


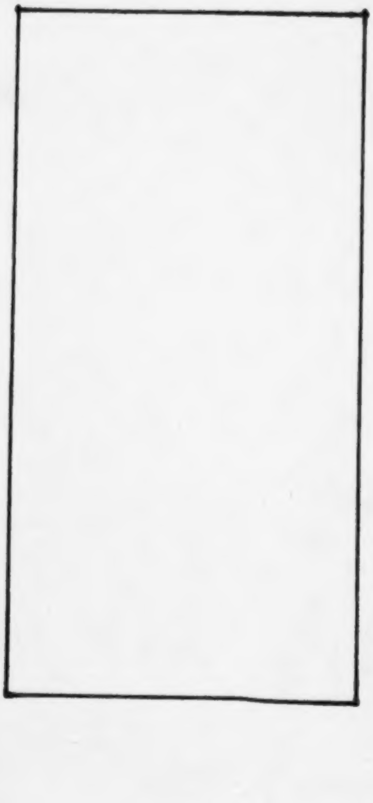


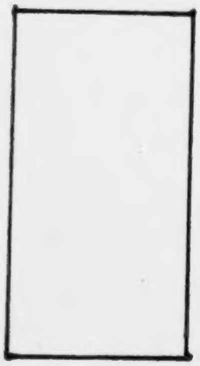
Mathematician:____

"I covered each shape given with four geoblocks."



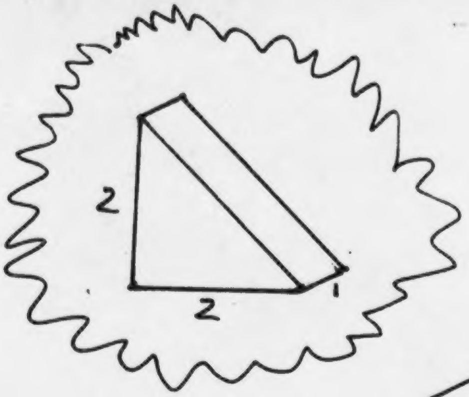


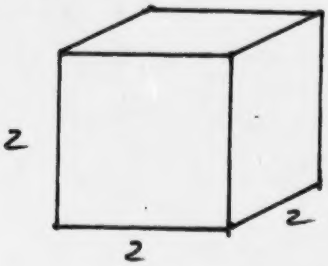


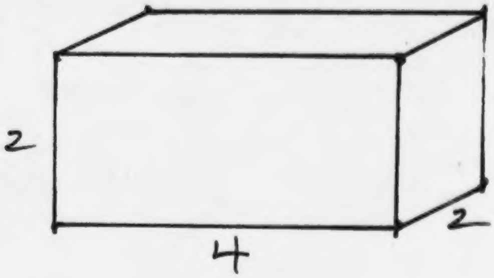


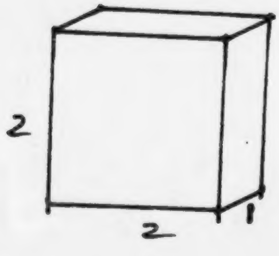
Mathematician:____

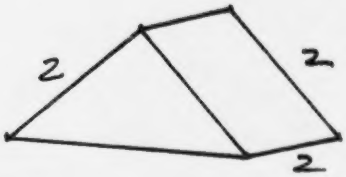
"I made the geoblocks shown out of blocks like the one given."





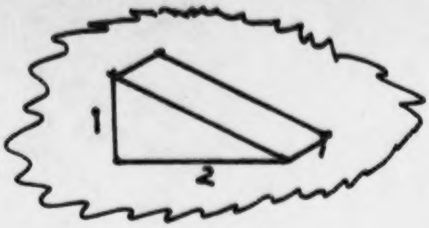


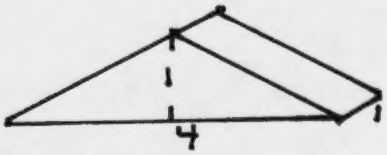


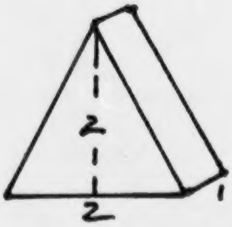


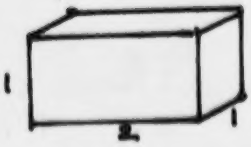
Mathematician:____

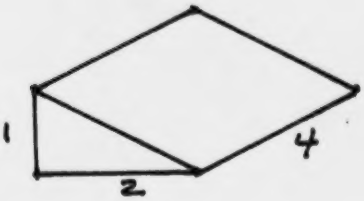
"I made the geoblocks shown out of blocks like the one given."

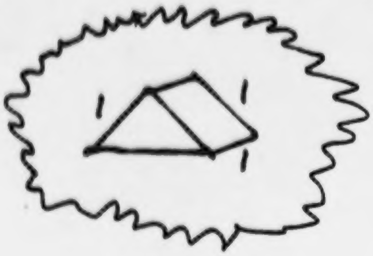


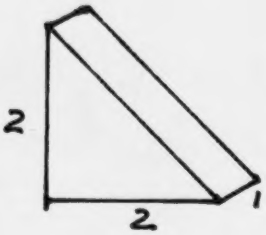


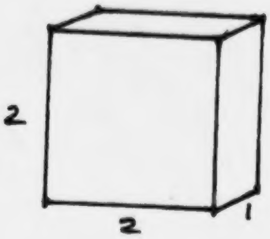


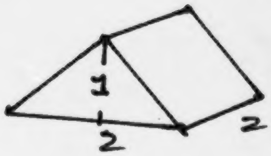


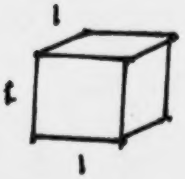






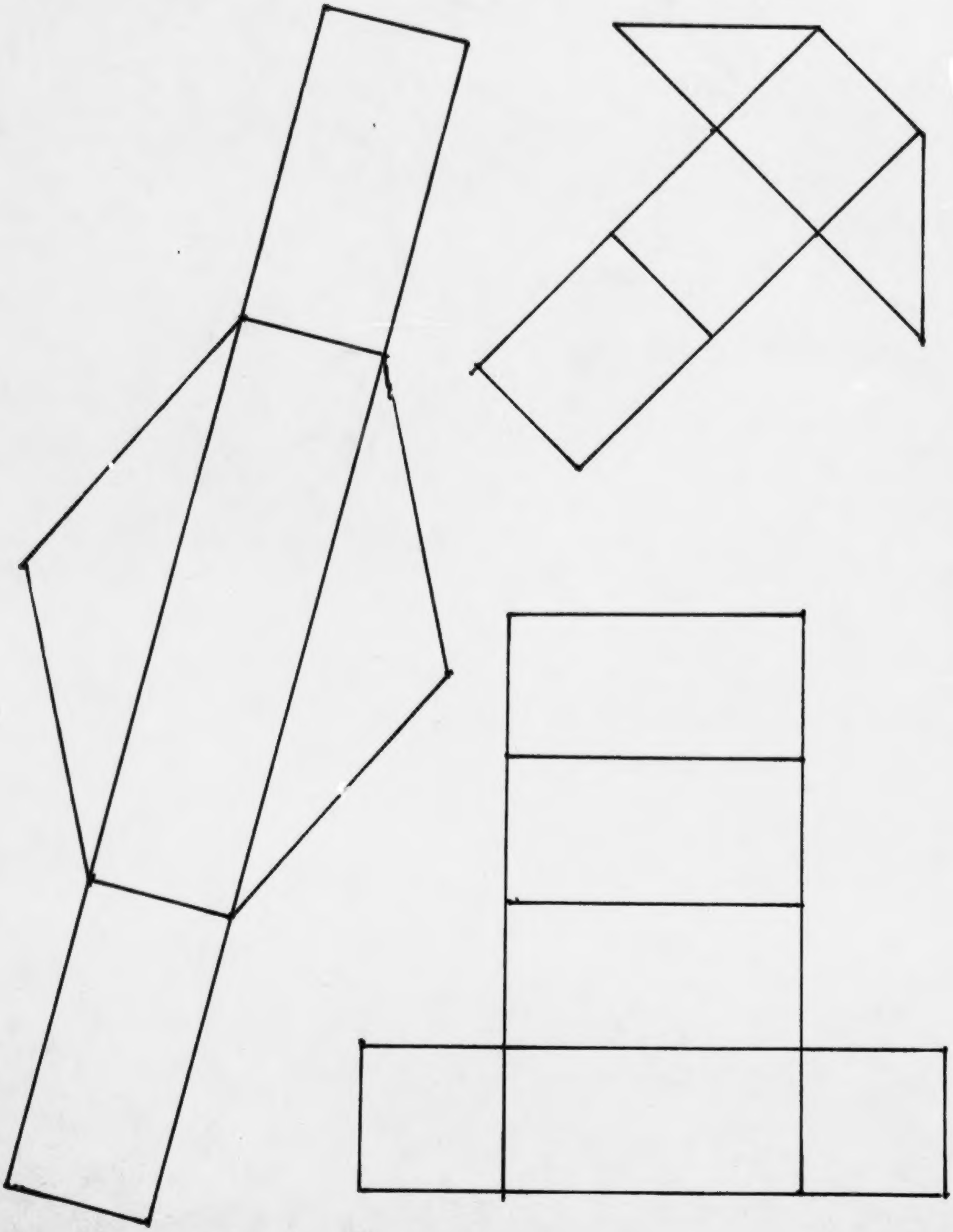






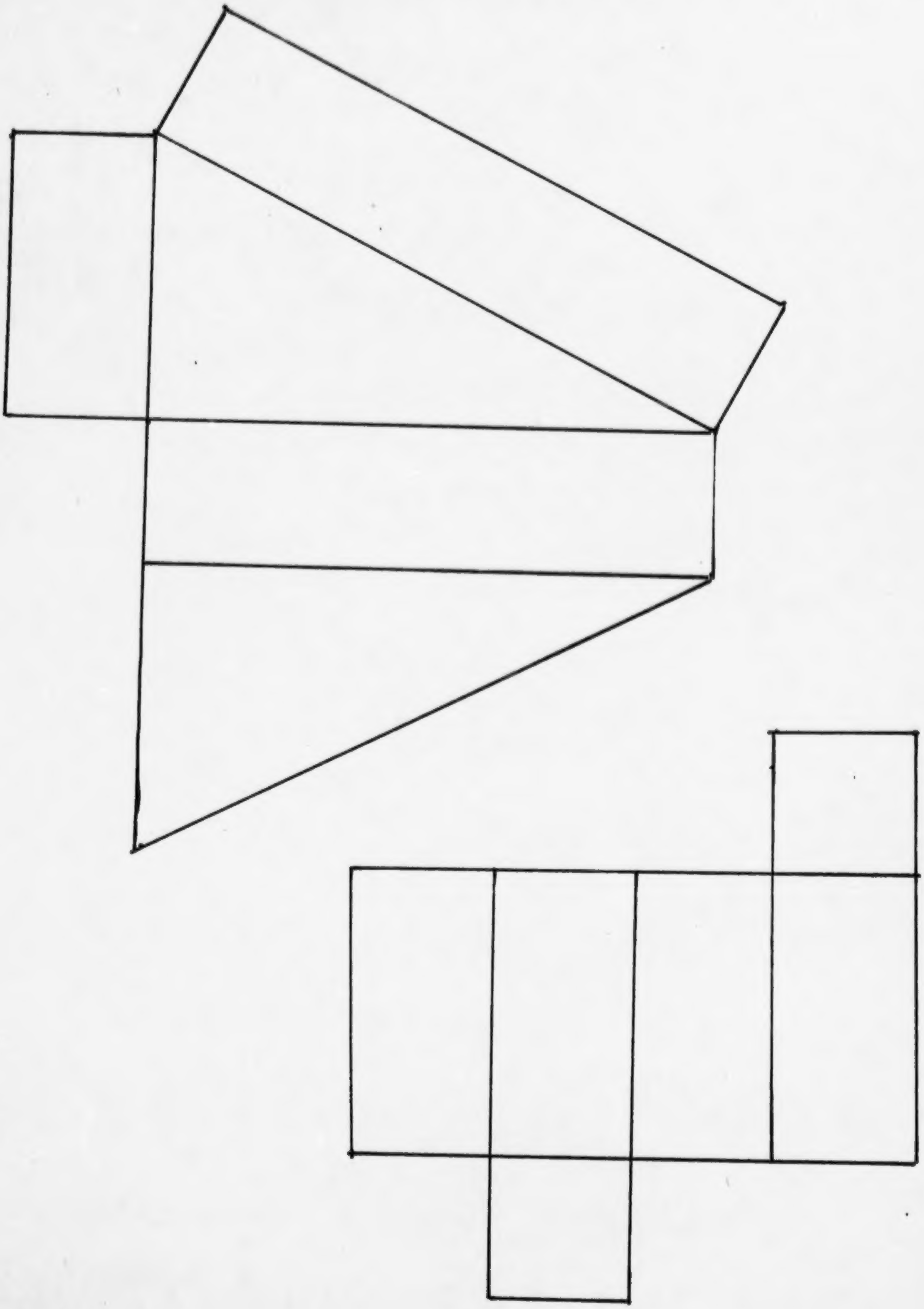
Mathematician: ____

"I found geoblocks to fit the geojackets given."



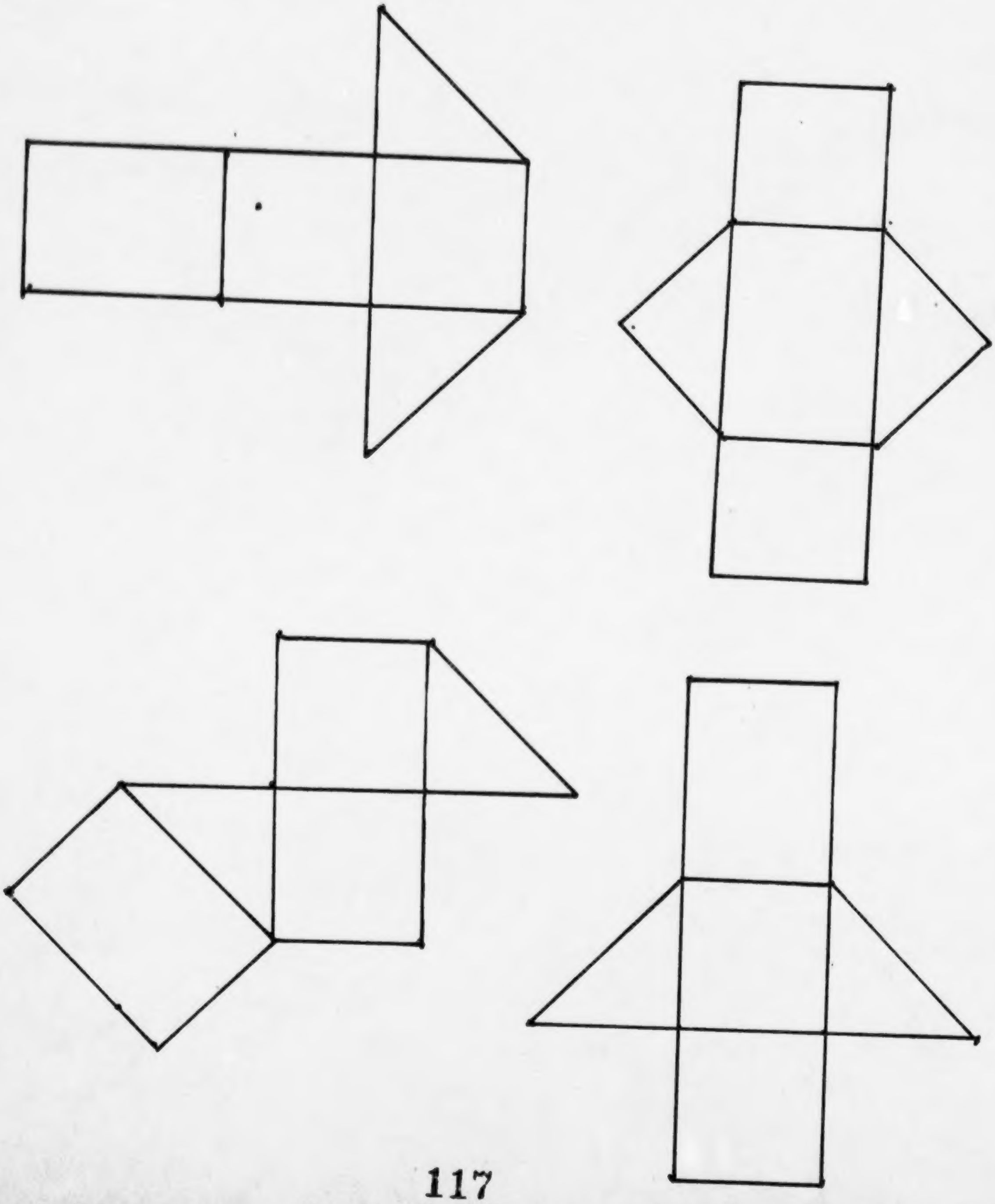
Mathematician: ____________________

"I found geoblocks to fit the geojackets given."



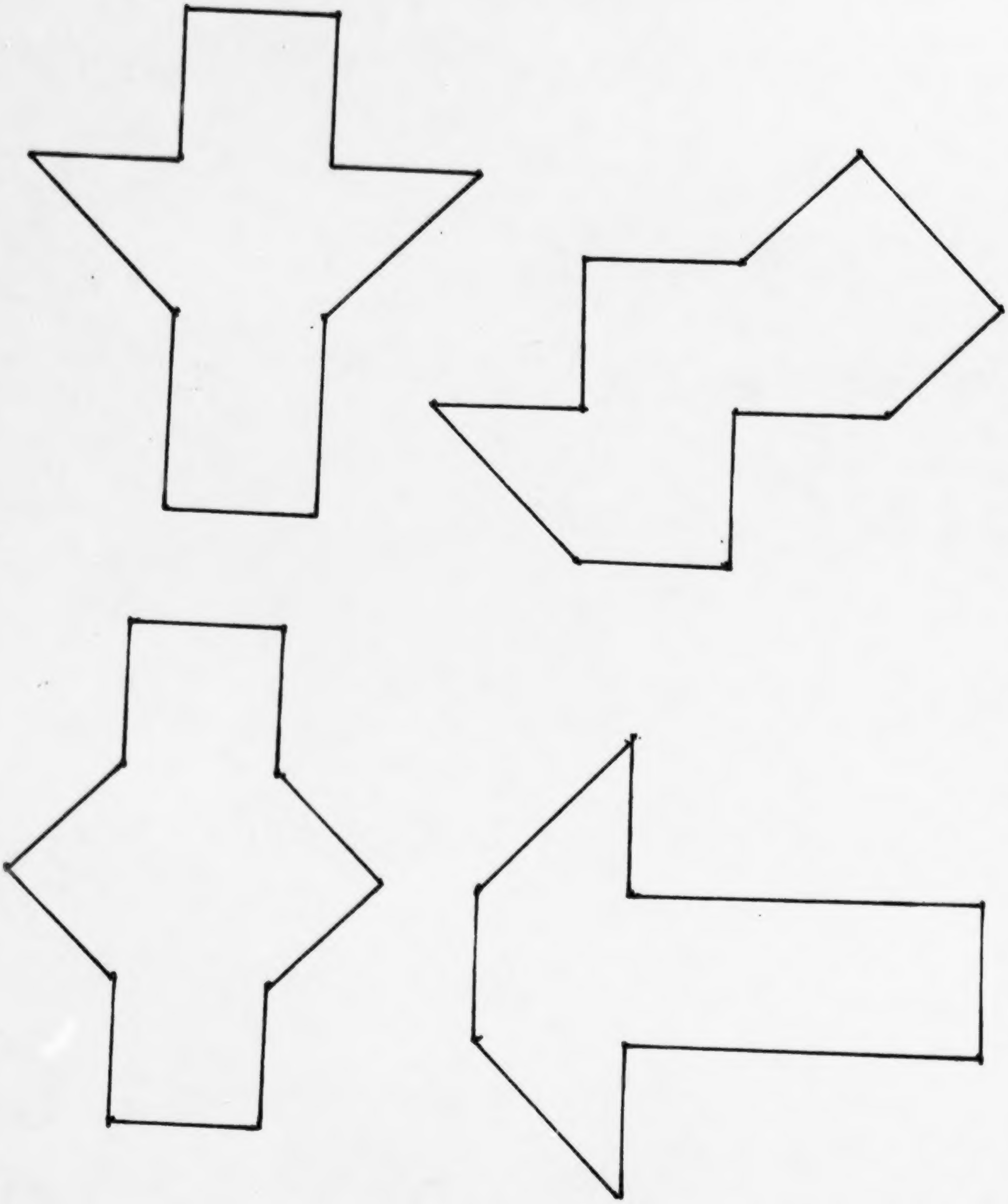
Mathematician:____

"I found geoblocks to fit the geojackets given."



Mathematician:____

"I drew all lines of symmetry for the geojackets given."

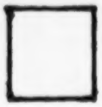


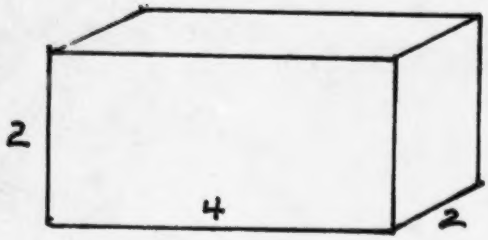
Which block do all of these Geojackets fit?

____

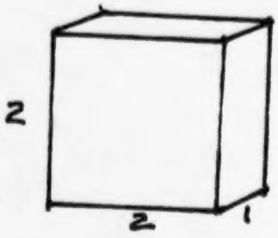
Mathematician:____

"I found the volume using C-1 cubes and the area using the unit square given for the geoblocks shown."

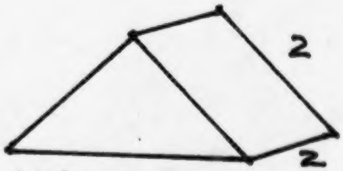




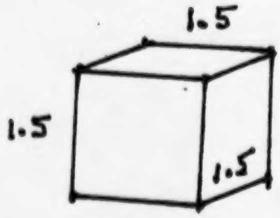
Volume ______
Area ______



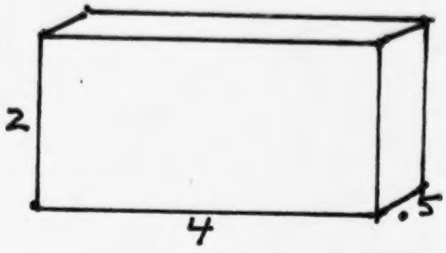
Volume ______
Area ______



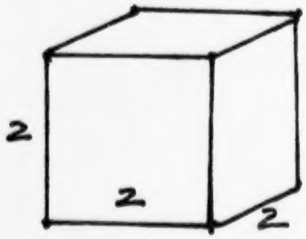
Volume ______
Area ______



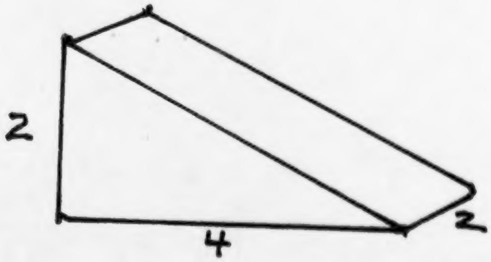
Volume ______
Area ______



Volume ______
Area ______



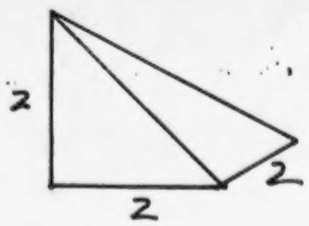
Volume ______
Area ______



Volume ______
Area ______

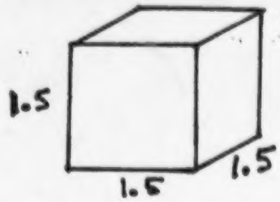
Mathematician: ______________________________

"I drew geojackets for the block shown."



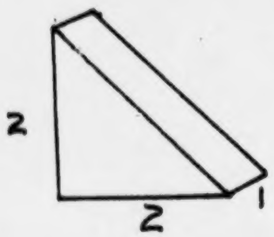
Mathematician:____

"I drew geojackets for the block shown."



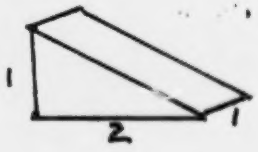
Mathematician:____

"I drew geojackets for the block shown."



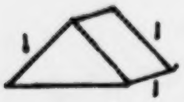
Mathematician:____

"I drew geojackets for the block shown."



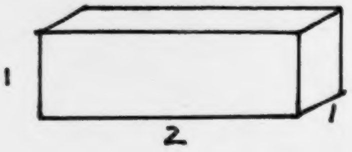
Mathematician:____

"I drew geojackets for the block shown."



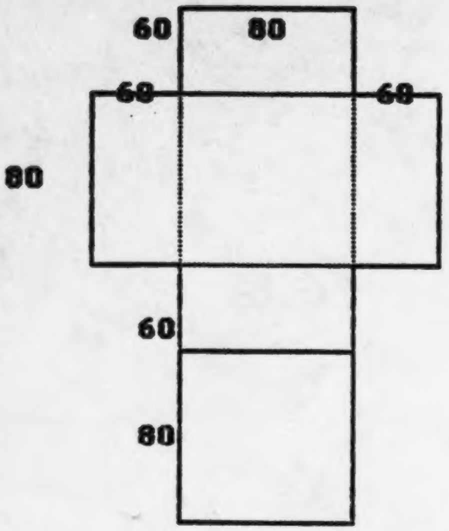
Mathematician:____

"I drew geojackets for the block shown."

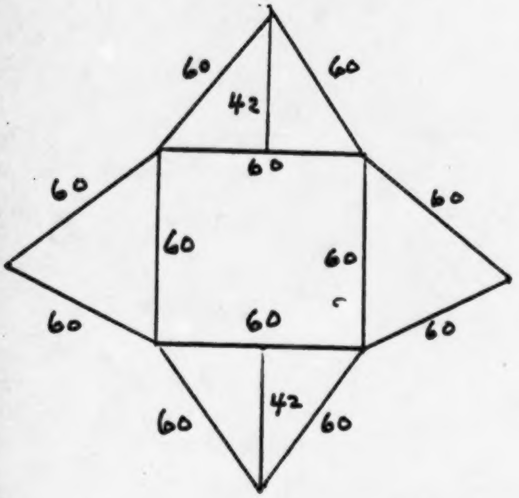


Mathematician:____

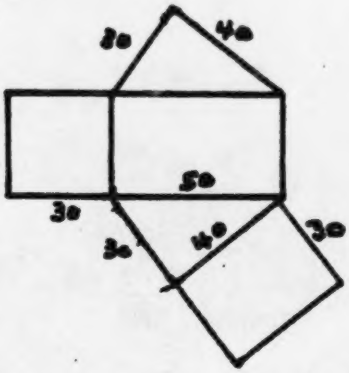
"I found the total areas of the 'geojacket' shapes given."


60
80
60
60
80
60
80

Total Area


60
60
42
60
60
60
60
60
60
60
60
60
60
42
60

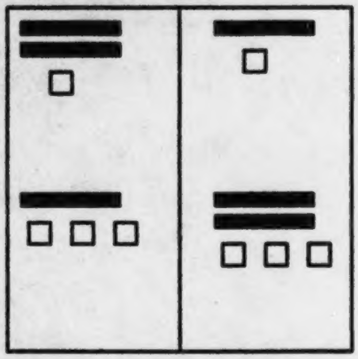
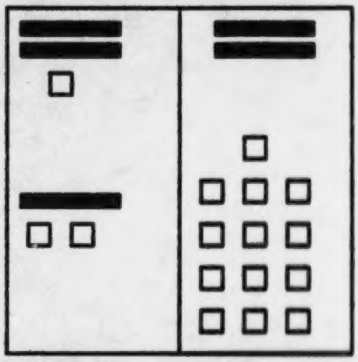
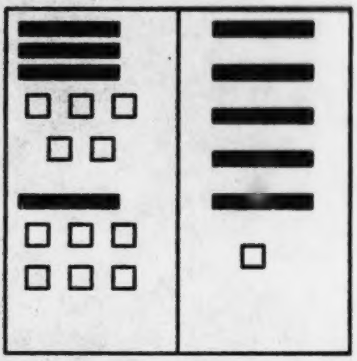
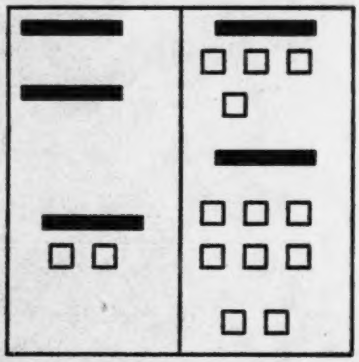
Total Area


30
40
50
30
30
40
30

Total Area

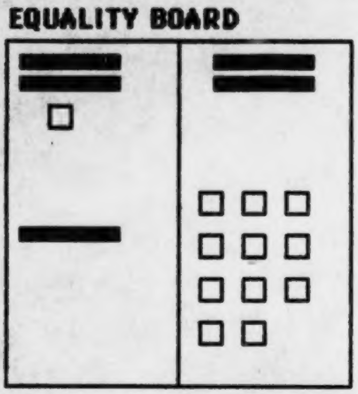
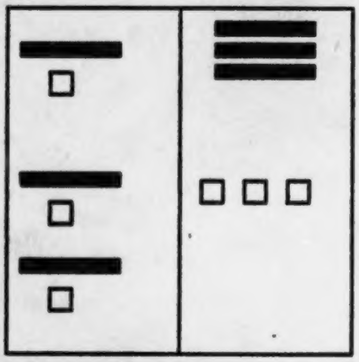
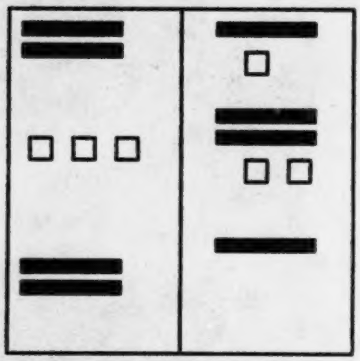
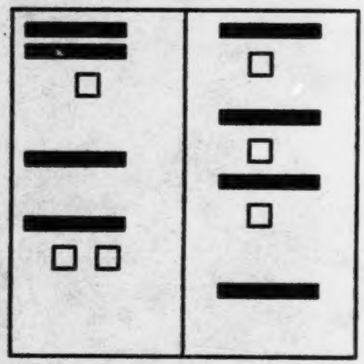
Mathematician:____

"I wrote number sentences for the equality boards shown."

EQUALITY BOARD	NUMBER SENTENCE
	________ = ________
	________ = ________
	________ = ________
	________ = ________

Mathematician:____

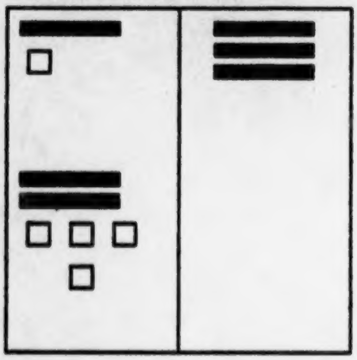
"I wrote number sentences for the equality boards shown."

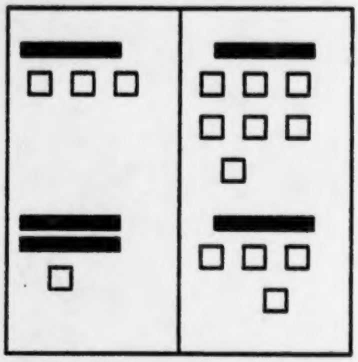
EQUALITY BOARD	NUMBER SENTENCE
	________ = ________
	________ = ________
	________ = ________
	________ = ________

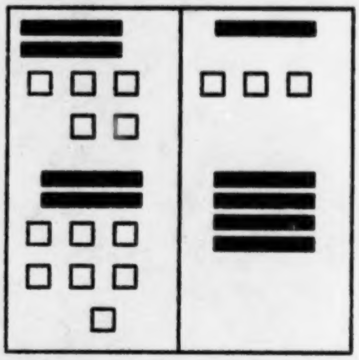
Mathematician:____________________________________

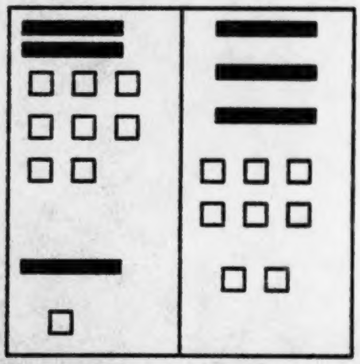
I placed the sign to show how the numbers compare. The point of the sign always points to the smaller number and I wrote the numerals and sign between them."

EQUALITY BOARD **NUMERALS**



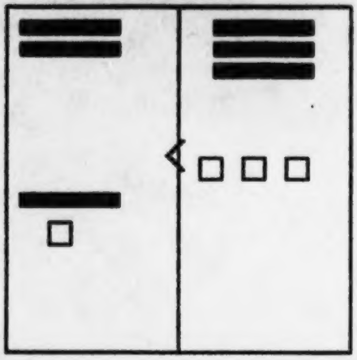
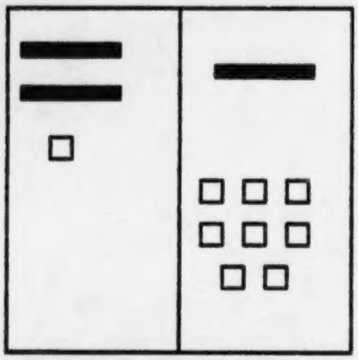
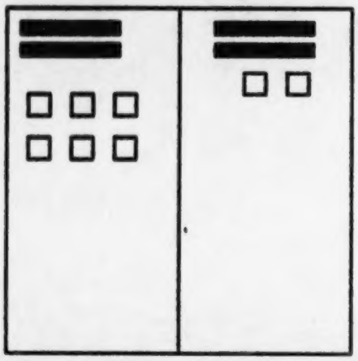
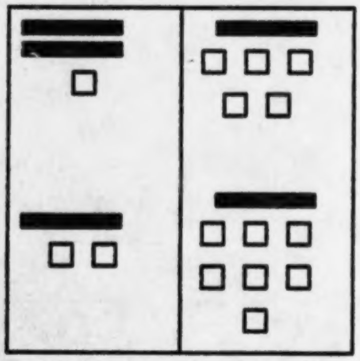






Mathematician:____________________________________

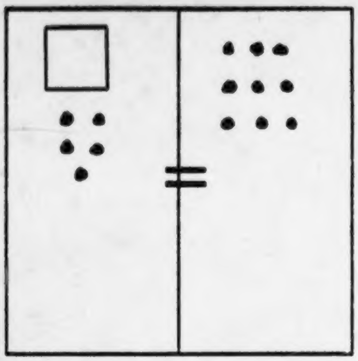
I placed the sign to show how the numbers compare. The point of the sign always points to the smaller number and I wrote the numerals and sign between them."

EQUALITY BOARD	NUMERALS
	$20 + 11 < 33$
	
	
	

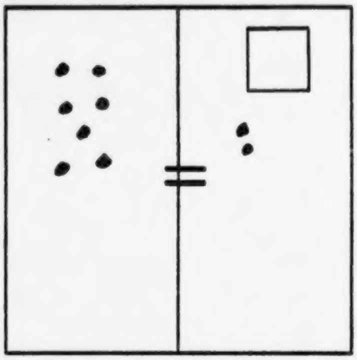
Mathematician:____

"I SUBTRACTED the same number of chips from each side to see what the hidden number is."

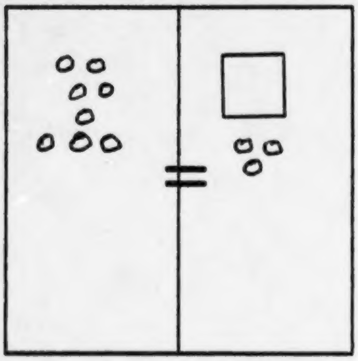
● = +
○ = −



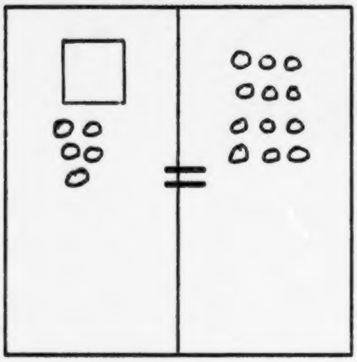
Example: ☐ = $^+4$



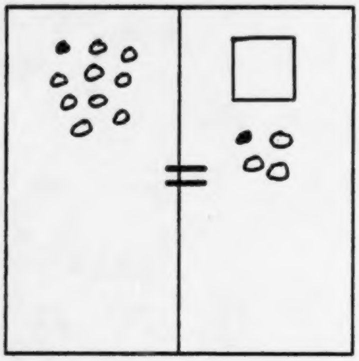
= ☐



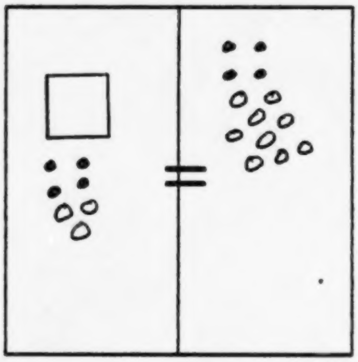
= ☐



☐ =



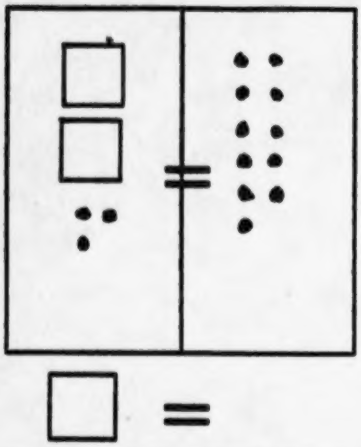
= ☐

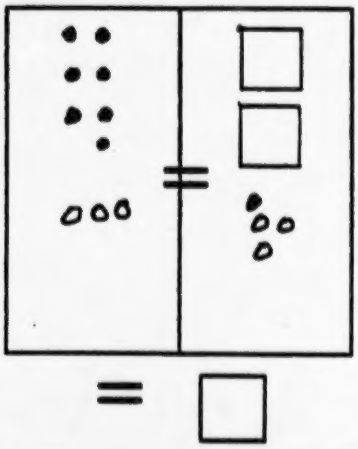


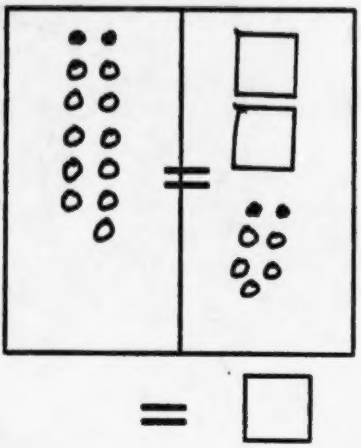
☐ =

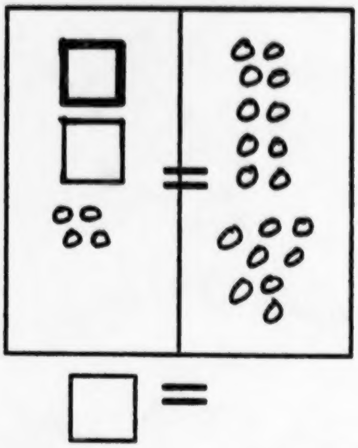
Mathematician:____

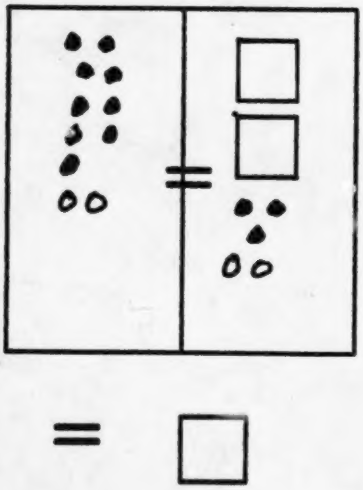
● = +
○ = –

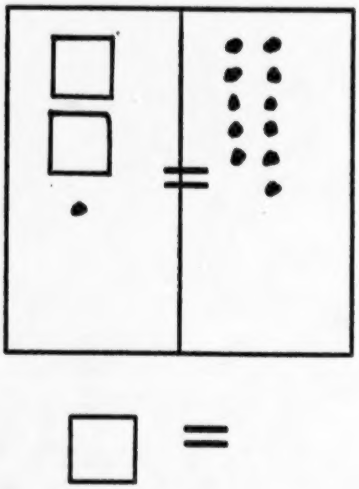










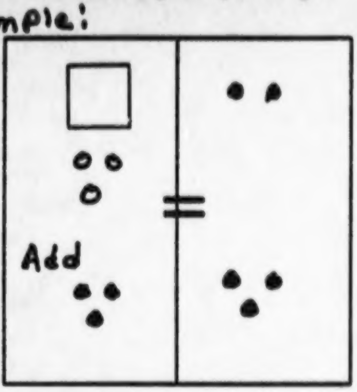


Mathematician:____

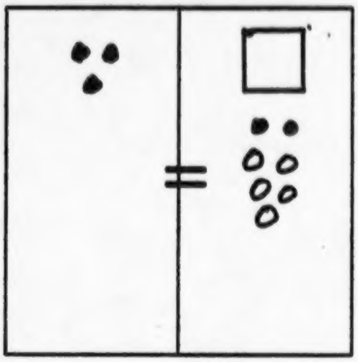
● = +
○ = −

"I found the number missing in these open sentences by adding or subtracting chips to get □ + 0 = some number."

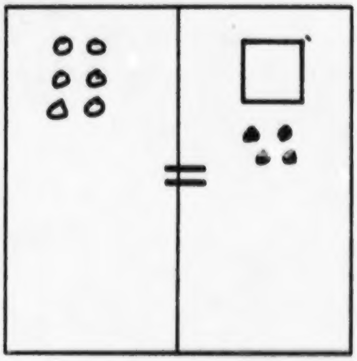
Example:



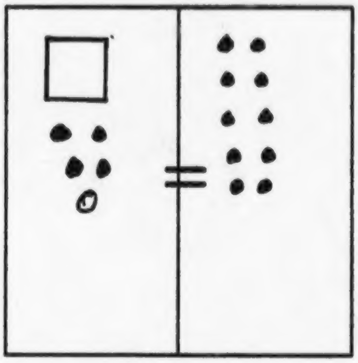
□ = ⁺5



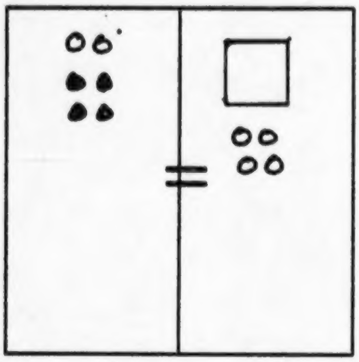
= □



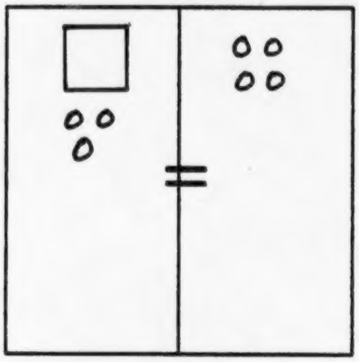
= □



□ =



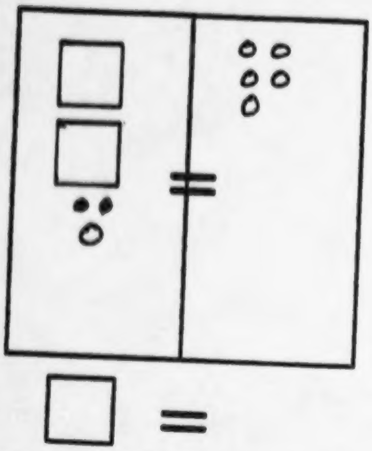
= □

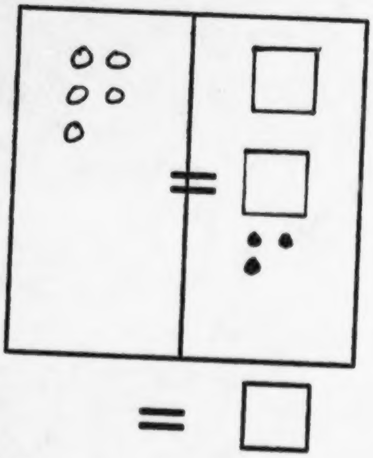


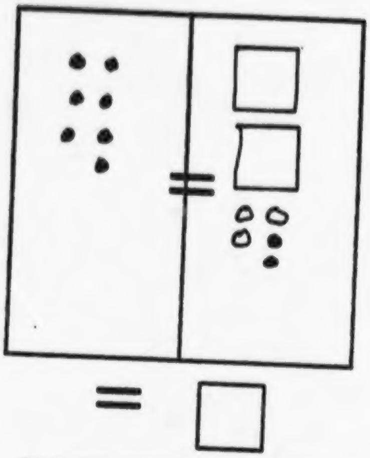
□ =

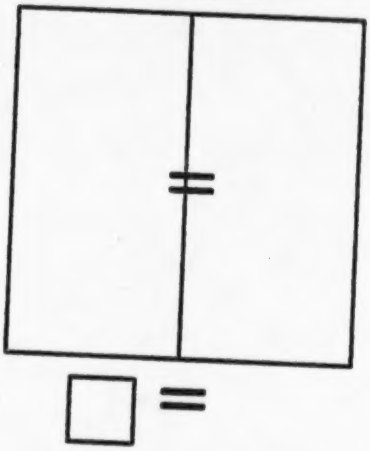
Mathematician:____

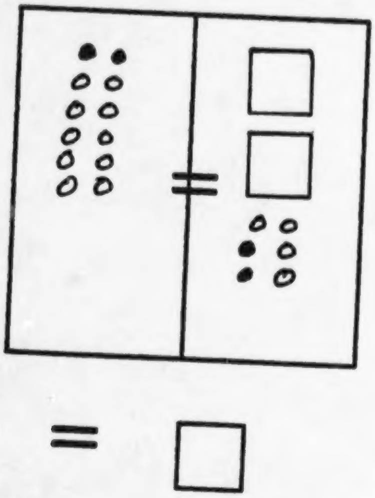
● = +
○ = −

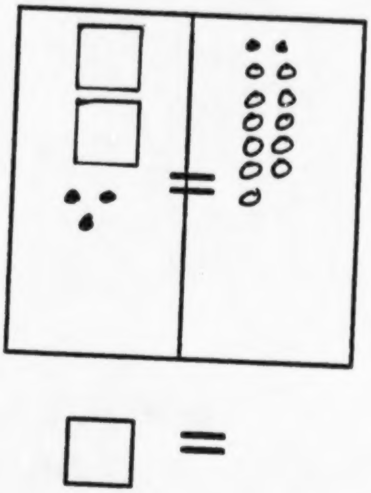






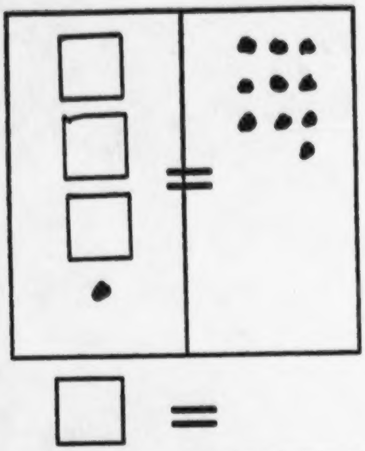


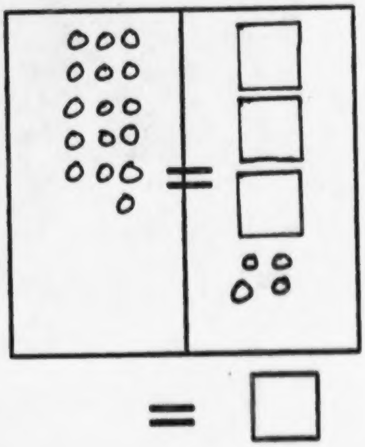


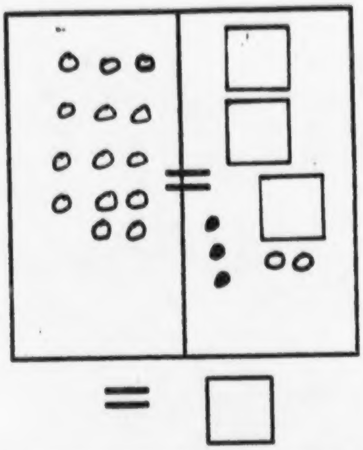


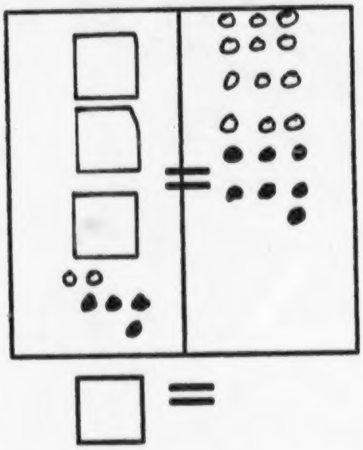
Mathematician:____

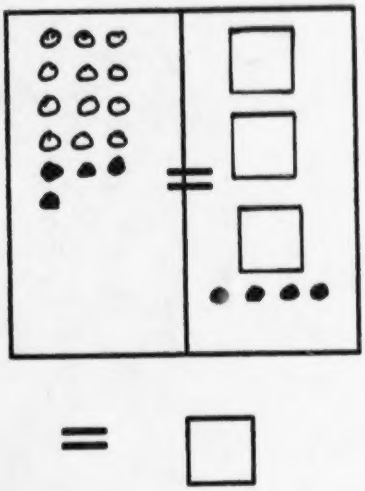
● = +
○ = −

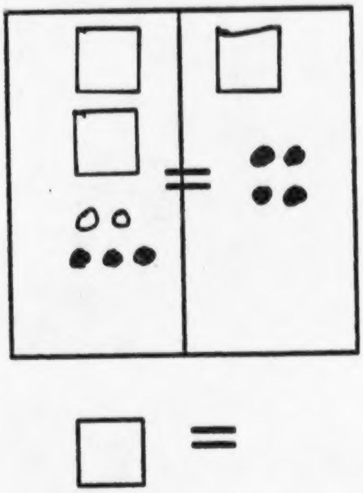






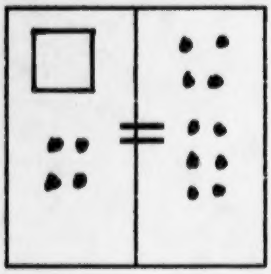
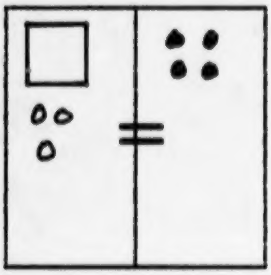
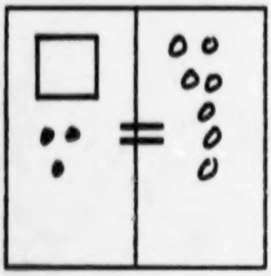






Mathematician:____

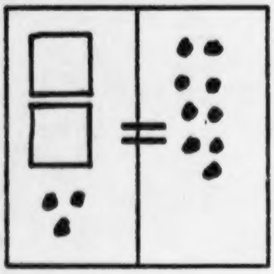
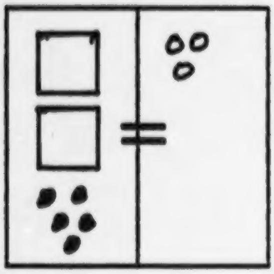
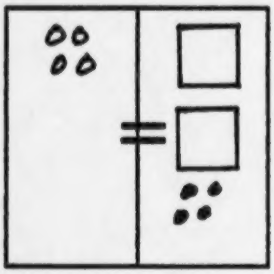
"I wrote open sentences to show the board, removed or added + and - chips as needed to solve for □."

Equality Board	Open Sentence	The number for □
Example: 	□ + 4 = 10	6
		
		

112098

Mathematician:____

"I wrote open sentences to show the board, removed or added + and - chips as needed to solve for ☐."

Equality Board	**Open Sentence**	**The number for** ☐
		
		
		

112098

Mathematician:____

"I added or subtracted to get to see how many ☐'s were equal to what number."

Open Sentence	☐ =	Checks
Example: 2☐ + 5 = 17 − 5 −5 2☐ = 12 ☐ = 6	6	$2\boxed{6} + 5 = 17$ $12 + 5 = 17$
3☐ − 5 = 14		
20 = 5 + 3☐		
3☐ − 4 = 17		
2☐ + 88 = 12		

Mathematician:____

"I added numbers to both sides or subtracted numbers from both sides to find the number for □."

OPEN SENTENCE	WHAT I DID
Example $14 = 9 + \square$ $5 = \square$	Subtracted 9 from both sides
$3 - \square = 1$	
$17 = 2\square + 5$	
$2\square - 3 = 9$	
$2\square + 4 = {}^{-}2$	

112288

Mathematician:____

"I added numbers to both sides or subtracted numbers from both sides to find the number for ☐ ."

OPEN SENTENCE	**WHAT I DID**
$2\square - 7 = {}^{-}15$	
$3\square + 4 = 13$	
$1 = 7 - 2\square$	
$3\square - 1 = 17$	
$2\square + 6 = {}^{-}8$	

112288

2. **Mathematician:**____

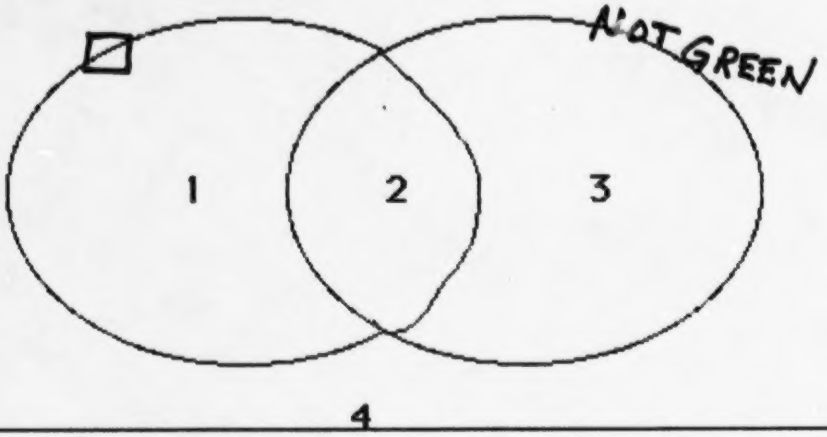
"I added or subtracted to get to see how many $\square$'s were equal to what number."

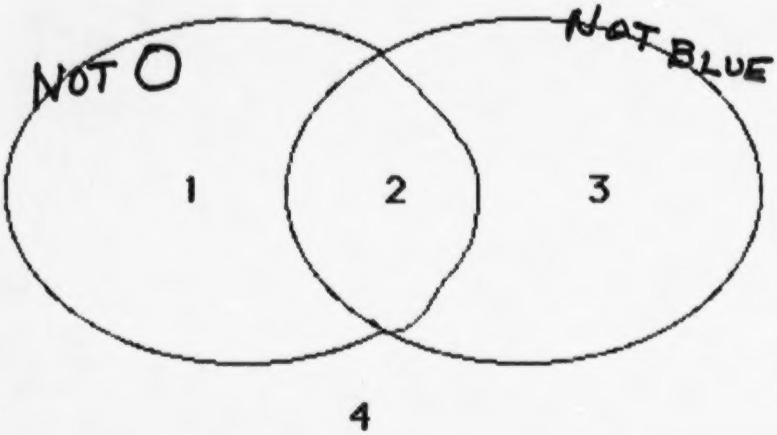
Open Sentence	$\square =$	**Checks**
$3\square - 1 = \square + 3$		
$2\square + 3 = \square + 7$		
$3\square + 1 = 9 - \square$		
$5\square + 2 = 22$		
$3\square + 1 = 2\square + 7$		

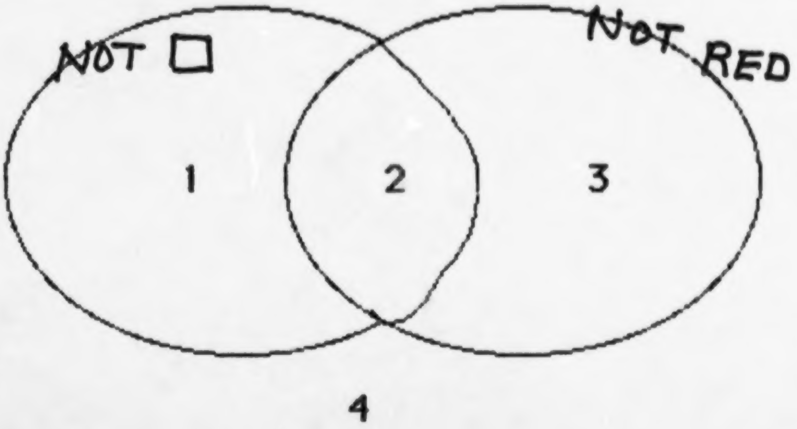
1212SY.Te

Mathematician:____

"I sorted the pieces according to each set of requirements and drew pictures of the pieces in each place."

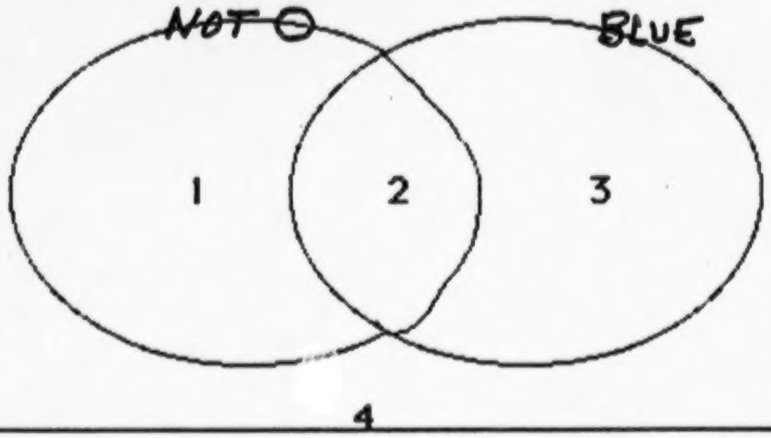

□
NOT GREEN
1
2
3
4

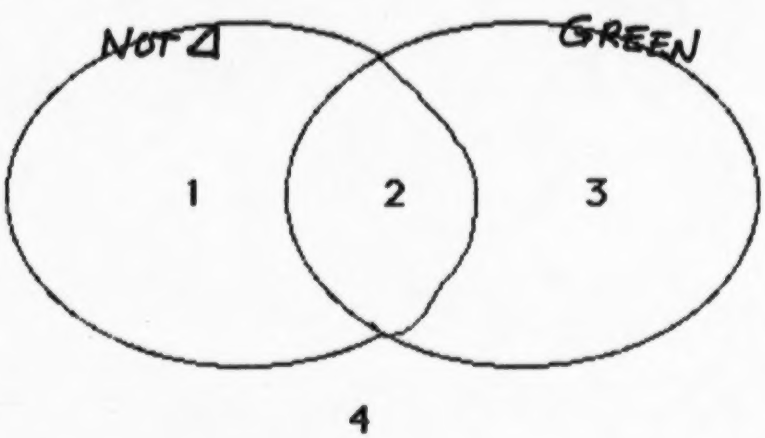

NOT ○
NOT BLUE
1
2
3
4

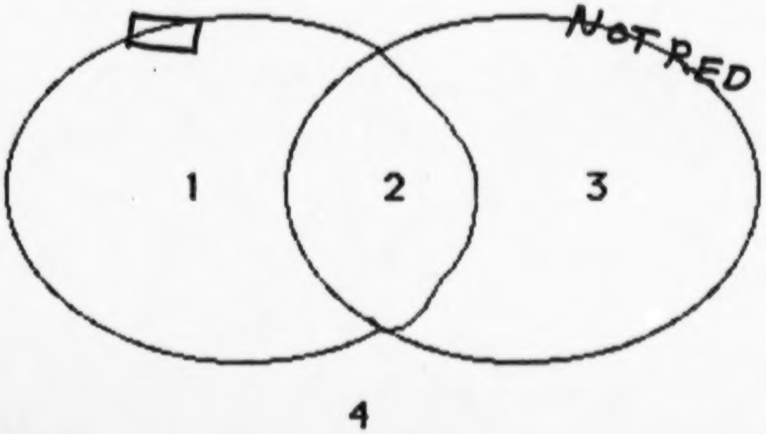

NOT □
NOT RED
1
2
3
4

Mathematician:____

"I sorted the pieces according to each set of requirements and drew pictures of the pieces in each place."

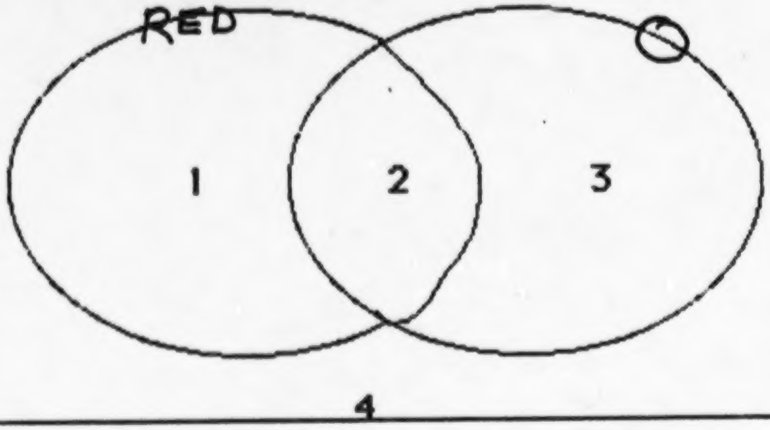

NOT ○
BLUE
1
2
3
4

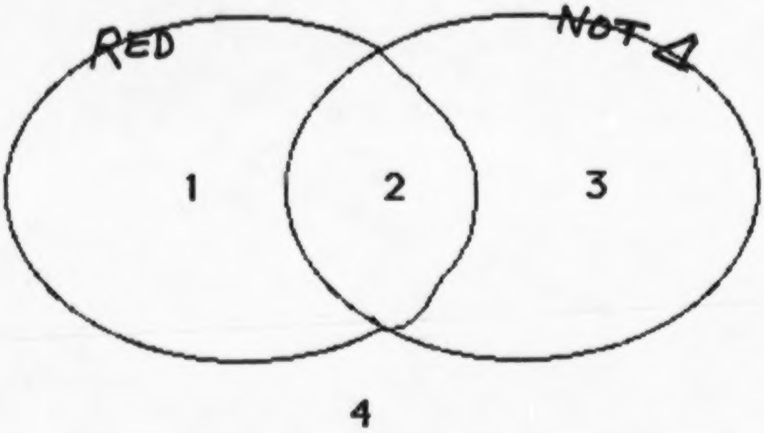

NOT △
GREEN
1
2
3
4

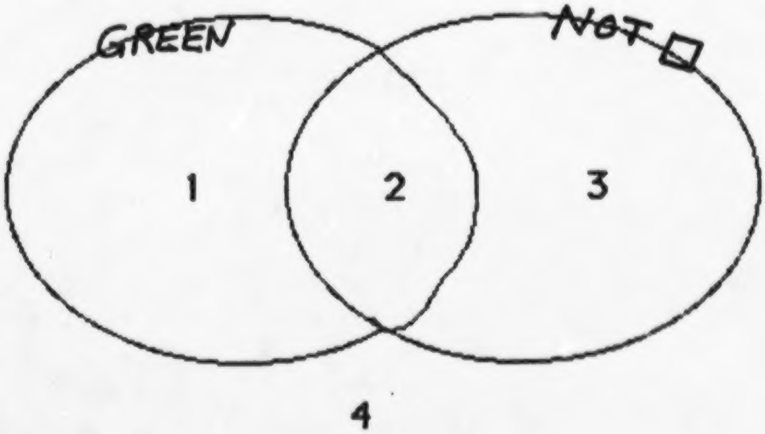

▱
NOT RED
1
2
3
4

Mathematician:____

"I sorted the pieces according to each set of requirements and drew pictures of the pieces in each place."




RED
NOT △
1
2
3
4

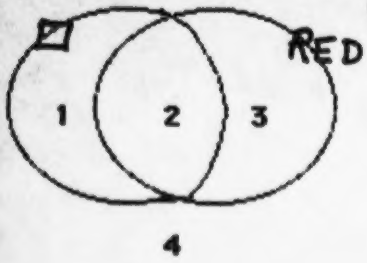

GREEN
NOT □
1
2
3
4

Mathematician:____

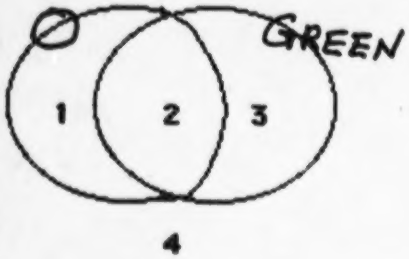
"I sorted the blocks into each region. I wrote a description of the blocks in each of regions 1, 2, 3 and 4."

REQUIREMENTS **DESCRIPTIONS**

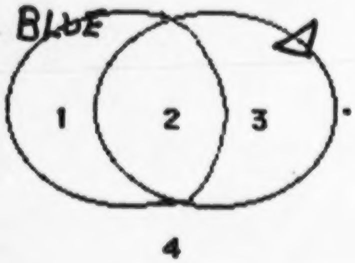
Example



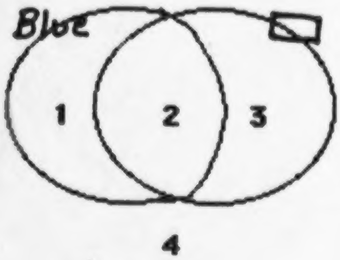
1. Square, but not red
2. Red and square
3. Red, but not square
4. not red and not square



1,
2.
3.
4.



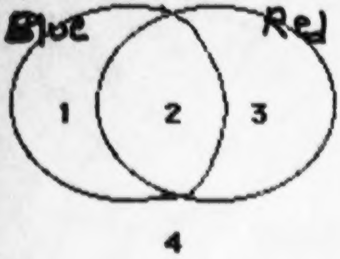
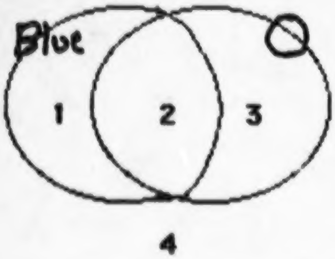
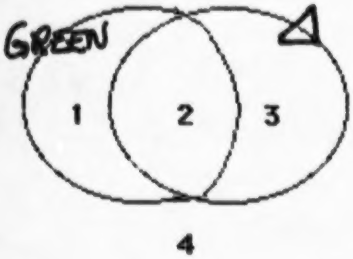
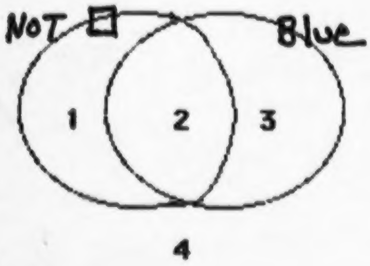
1.
2.
3.
4.



1.
2.
3.
4.

Mathematician:____

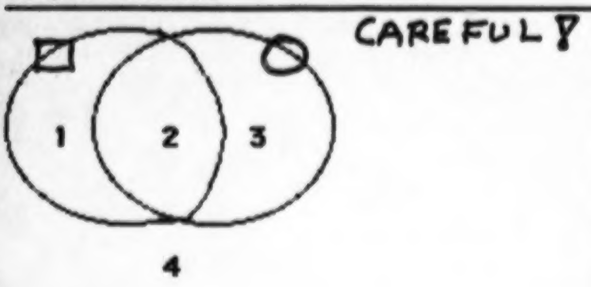
"I sorted the blocks into each region. I wrote a description of the blocks in each of regions 1, 2, 3 and 4."

REQUIREMENTS	**DESCRIPTIONS**
 Blue Red 1 2 3 4 CAREFUL!	1. 2. 3. 4.
	1. 2. 3. 4.
	1. 2. 3. 4.
 NOT □ Blue 1 2 3 4	1. 2. 3. 4.

Mathematician:____

"I sorted the blocks into each region. I wrote a description of the blocks in each of regions 1, 2, 3 and 4."

REQUIREMENTS **DESCRIPTIONS**

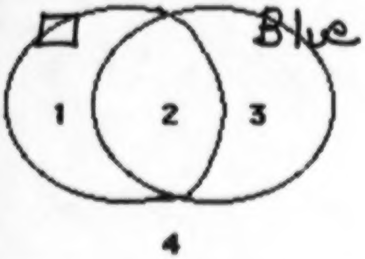

CAREFUL!
1
2
3
4

1.

2. Nothing goes here – why?

3.

4.

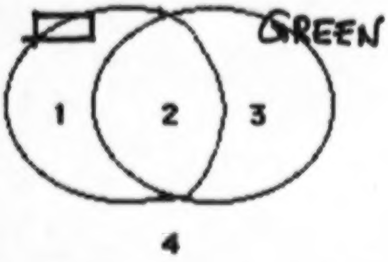


1.

2.

3.

4.

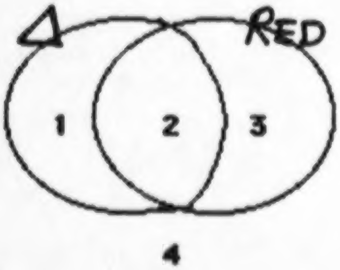


1.

2.

3.

4.



1.

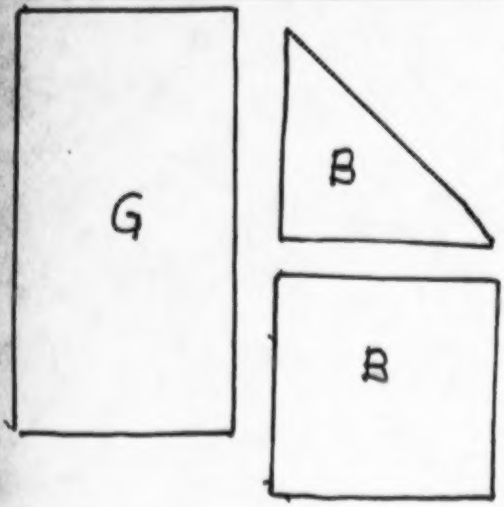
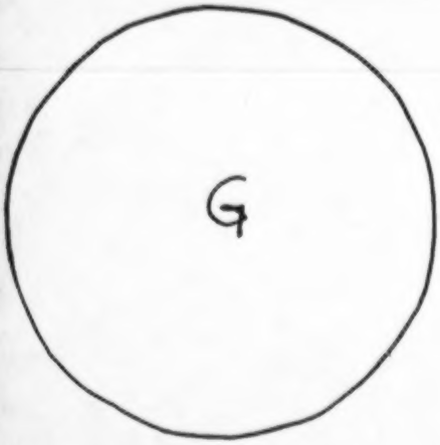
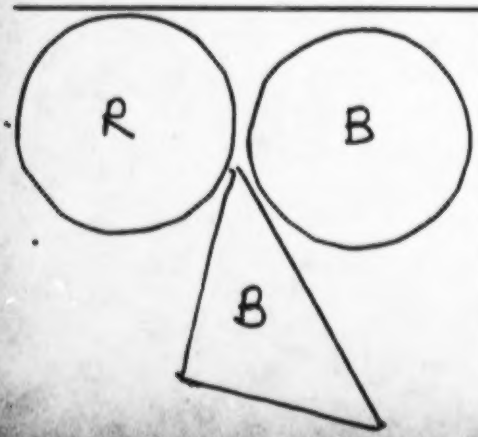
2.

3.

4.

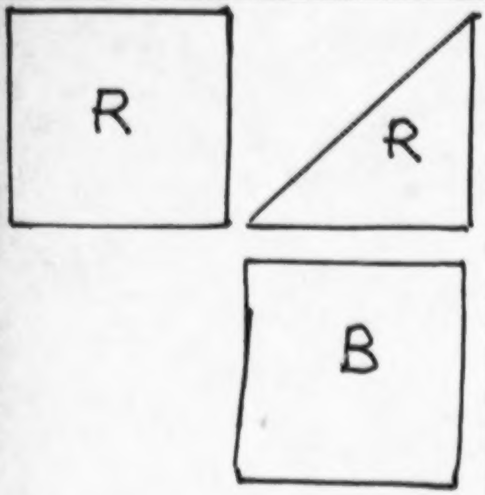
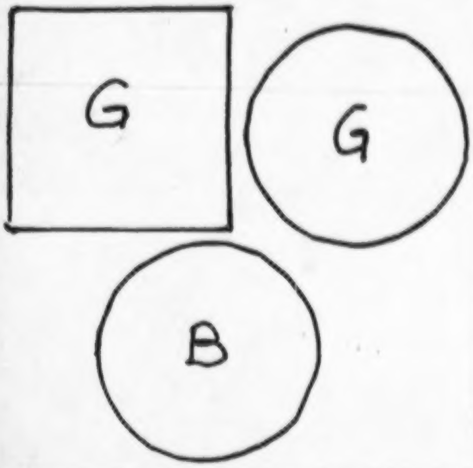
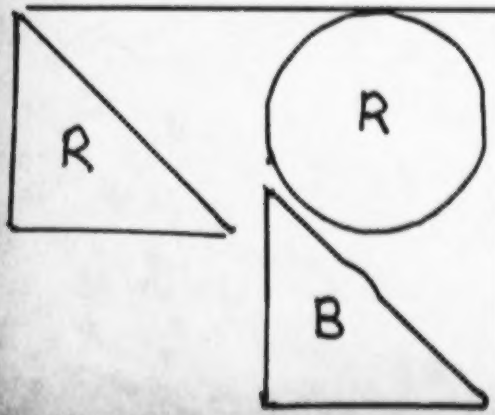
Mathematician:______________________________

"I wrote IF-THEN sentences for the collections given that are TRUE. For each TRUE statement, I found a piece that would make it FALSE when added to the collection."

PIECES GIVEN	TRUE STATEMENTS	PIECE TO MAKE GIVEN TRUE STATEMENT FALSE
		
		
		

Mathematician:____

"I wrote IF-THEN sentences for the collections given that are TRUE. For each TRUE statement, I found a piece that would make it FALSE when added to the collection."

PIECES GIVEN	TRUE STATEMENTS	PIECE TO MAKE GIVEN TRUE STATEMENT FALSE
		
		
		

Mathematician:____

"I put a check in YES for the phrases with INCLUSIVE OR, and in the NO if they were NOT using INCLUSIVE OR."

	INCLUSIVE OR?	
PHRASES	YES	NO
Thin or short		
Tall or ugly		
New York or Chicago		
Large or small		
Tall or handsome		
Rich or poor		
Small or pretty		
White or large		
Top or bottom		
Blue or Green		
John or the fireman		
Wood or plastic		
Donna or the police officer		
Doctor or lawyer		
RED or BLUE		
Girl or dancer		

11/2998

Mathematician:____

"I just put an X in the YES Column for phrases with EXCLUSIVE OR, and in the NO Column for those that did not use exclusive or."

	EXCLUSIVE OR?	
PHRASES	YES	NO
Red or Black		
Black or White		
White or Circle		
Black or Square		
The girl or the boy		
The man or the skier		
Fred or the farmer		
Peter or the dentist		
Joyce or the doctor		
In Washington or in New York		
Above or below		
Left or right		
Democrat or Republican		
Pitcher or Catcher		
In or Out		
On or Off		

Mathematician:____

"I sorted the phrases into INCLUSIVE OR and EXCLUSIVE OR by putting a check in the correct column."

PHRASES	EXCLUSIVE OR	INCLUSIVE OR
White or Circle		
The girl or the boy		
Red or Black		
The man or the skier		
Black or Square		
Joyce or the doctor		
Black or White		
Peter or the dentist		
Above or below		
Left or right		
Democrat or Republican		
Pitcher or Catcher		
In or Out		
On or Off		
Fred or the farmer		
In Washington or in New York		

12798

Mathematician:______________________________

Pg. 2

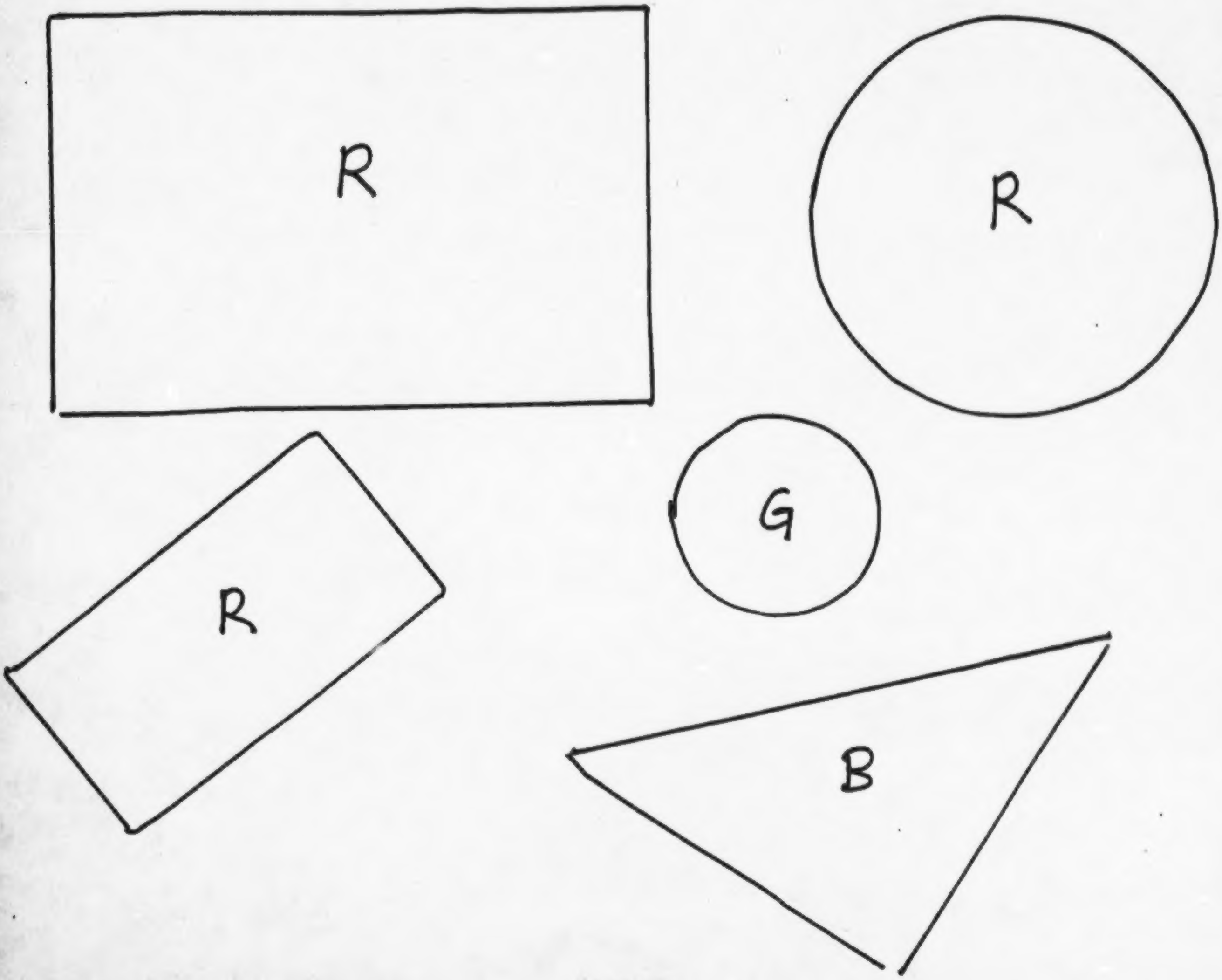
PHRASES	EXCLUSIVE OR	INCLUSIVE OR
RED or BLUE		
Thin or short		
Girl or dancer		
Tall or ugly		
New York or Chicago		
Large or small		
Tall or handsome		
Rich or poor		
Small or pretty		
White or large		
Top or bottom		
Blue or Green		
John or the fireman		
Wood or plastic		
Donna or the police officer		
Doctor or lawyer		

112788.1

Mathemtician:____

"I wrote statements TRUE of the given set of attribute blocks, and found a piece that would make one of these FALSE."

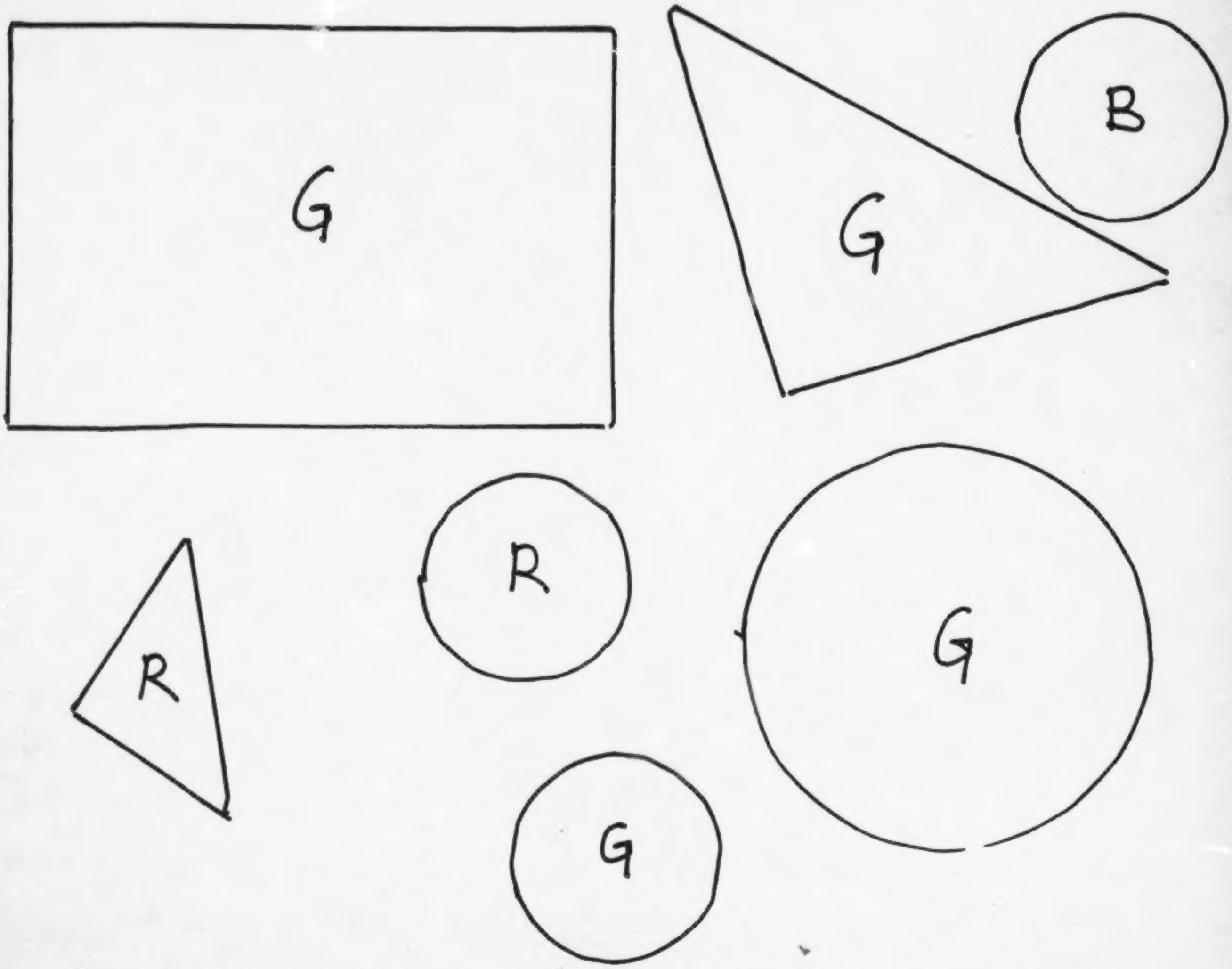
TRUE STATEMENTS	PIECE TO MAKE STATEMENT FALSE



Mathemtician:____

"I wrote statements TRUE of the given set of attribute blocks, and found a piece that would make one of these FALSE."

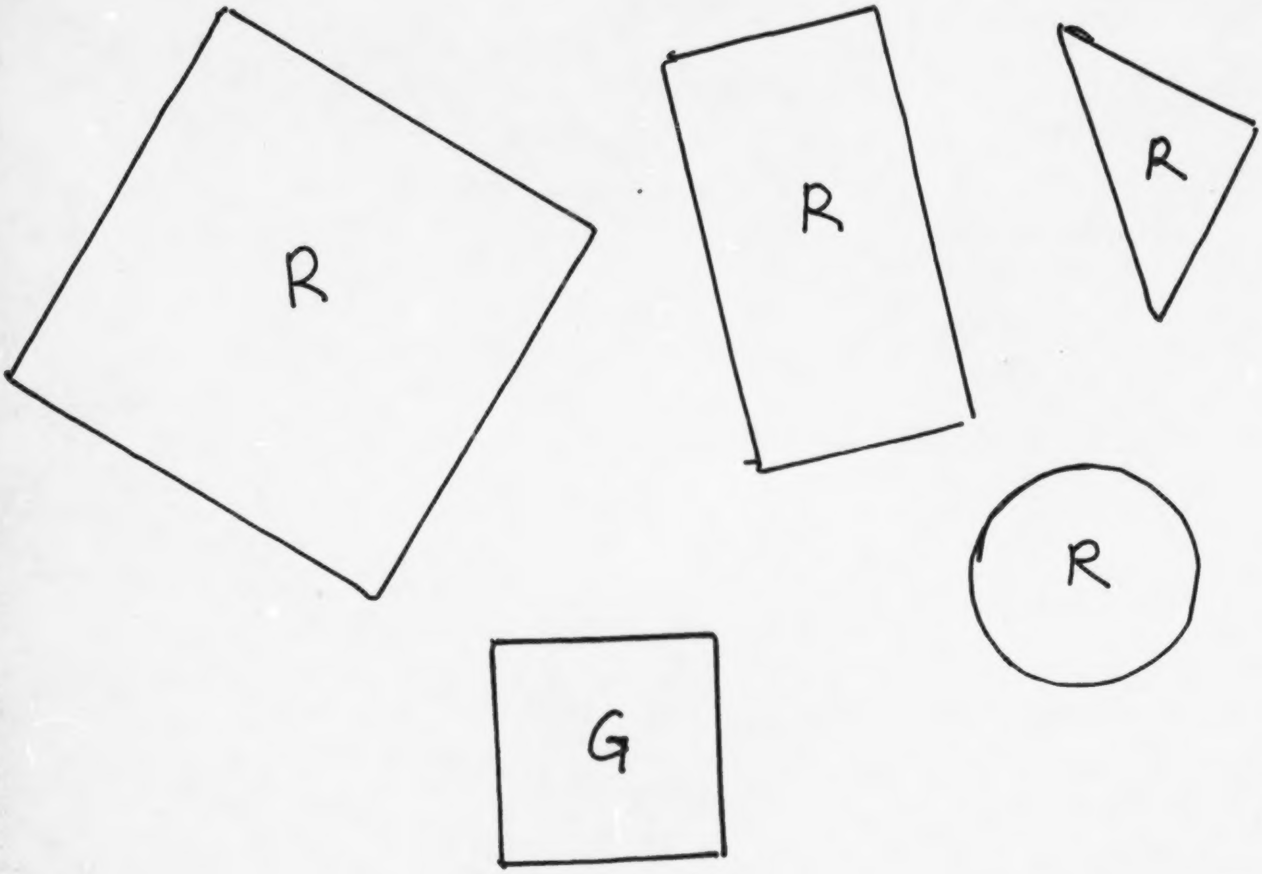
TRUE STATEMENTS	PIECE TO MAKE STATEMENT FALSE



Mathemtician:____

"I wrote statements TRUE of the given set of attribute blocks, and found a piece that would make one of these FALSE."

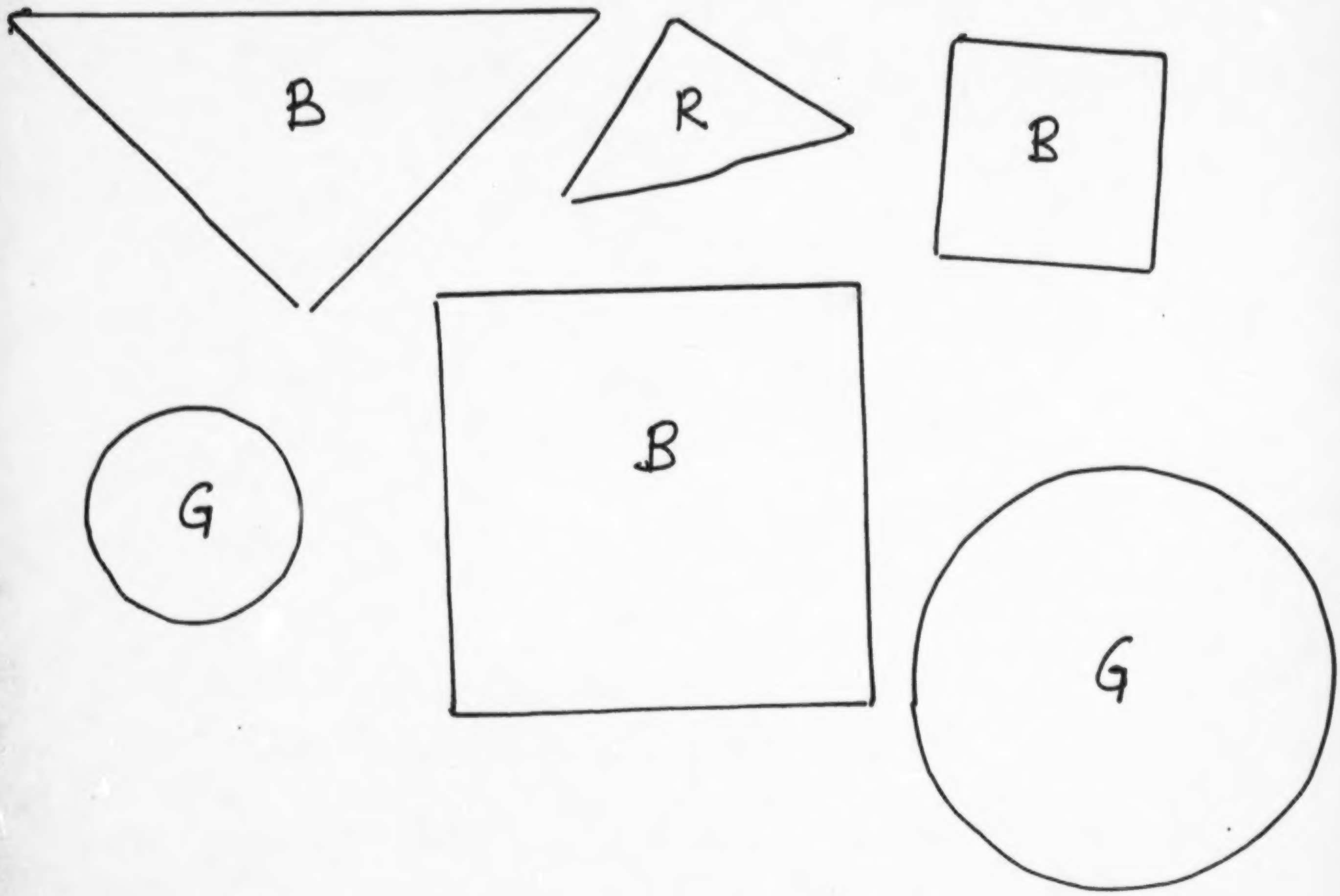
TRUE STATEMENTS	PIECE TO MAKE STATEMENT FALSE



Mathemtician:____

"I wrote statements TRUE of the given set of attribute blocks, and found a piece that would make one of these FALSE."

TRUE STATEMENTS	PIECE TO MAKE STATEMENT FALSE



12683.3

Mathematician:____

"I wrote numbers made up of multipliers with exponents and these with exponents as the product of multipliers."

As a Product	With Exponent
Example: 6 x 6 x 6	6^3
10 x 10 x 10 x 10	
	5^4
3 x 3 x 3 x 3	
4 x 4 x 4	
	2^8
Example: 5 x 5 x 10 x 10	$5^2 \times 10^2$
6 x 6 x 6 x 4 x 4	
	$3^2 \times 10^3$
5 x 5 x 10 x 10 x 10	
	$2^3 \times 10^4$

121988.4

Mathematician:____

"I wrote numbers with powers of ten and multiplied numbers by powers of ten."

A Single Number **Example: 327**	**With Powers of Ten** 3.27×10^2 (note that 3 is in 1< N <10)
433	
	2.06×10^2
107	
	1.1×10^4
4200	
	5.3×10^4
4070	
	2.13×10^3
481.3	
	9.99×10^3
909.3	

121988.4

Mathematician:____

"I used the calculator to complete these tables."

Pay increases so each year is 1.08 x the previous year."

Year	1	2	3	4	5
Pay	21,000				

"The cost of cans of corn are posted."

Number of cans	1	2	3	4	5	6	7	8
Total cost	.89							

"The number of miles travelled depends on the number of hours travelled at a given speed."

Number of hours	1	2	3	4	5	6	7
Speed	60						

"The cost of gasoline depends on the price for each gallon and the gallons bought."

No. of Gallons	1	2	3	4	5	6	7	8	9	10
Cost	1.099									

"Hamburger is sold in different size packages."

No. of pounds	1	2	3	5	10
Total cost	1.29				

"The cost of lumber depends on board feet bought at a given price."

No. of board feet	1	25	100	150	200
Price	4.78				

"The price of a suit goes down each day so the new price is $.85 of the previous price."

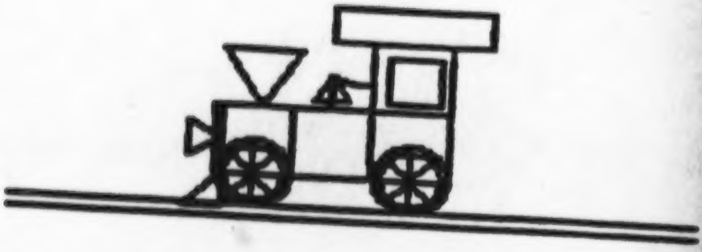
Day	1	2	3	4	5	6	7
Price	269	228.65					

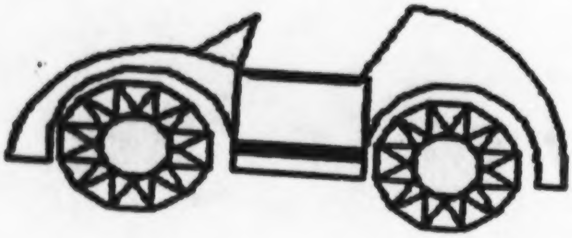
1.85921

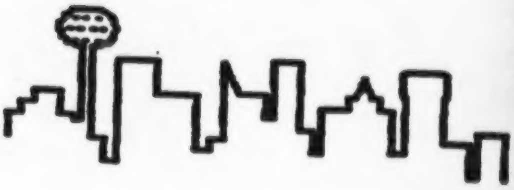
SOME CHALLENGES FOR LOGO EXPERTS

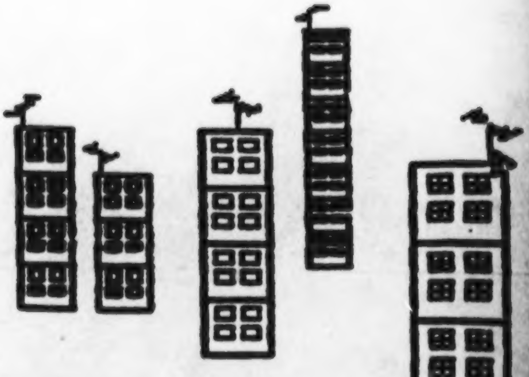
Here are some designs for you to try to write LOGO Procedures to make.

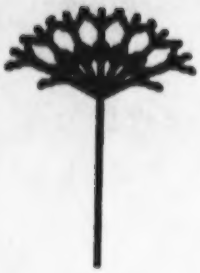
Use what you know about the REPEAT command, NESTED procedures and RECURSION.

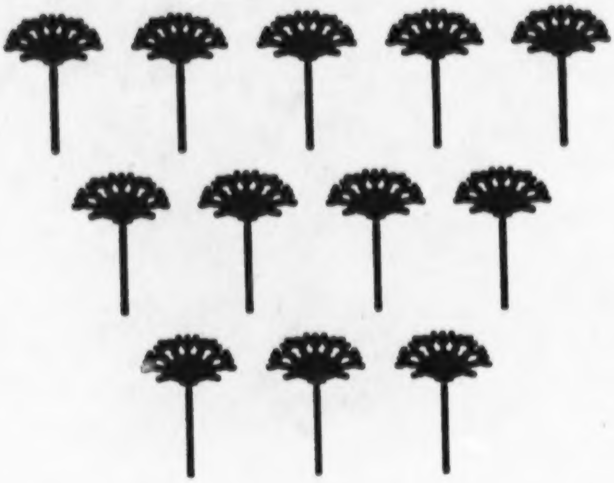


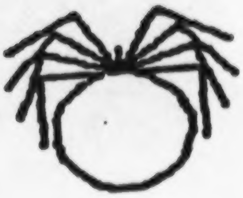


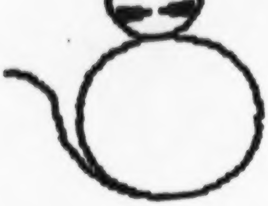


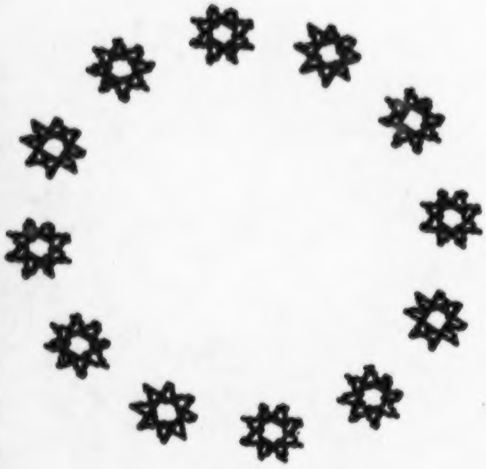


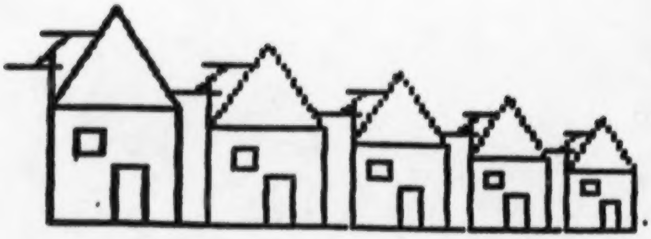


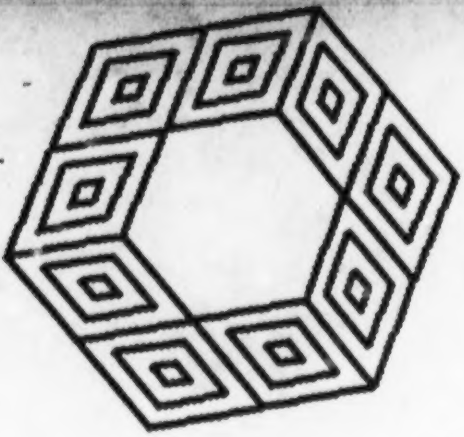


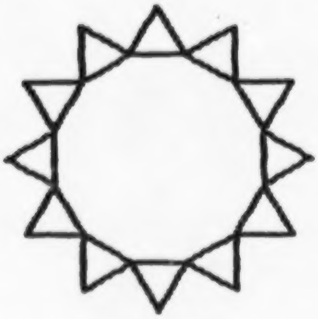


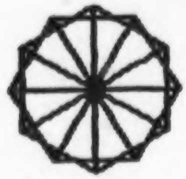


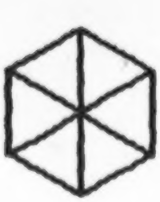


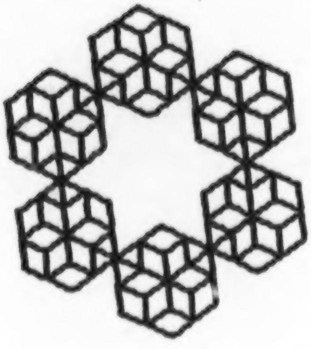


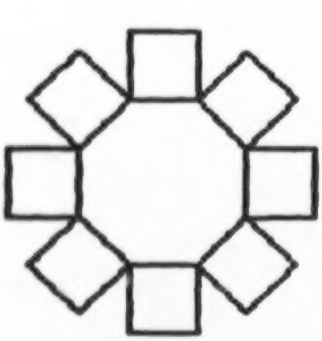


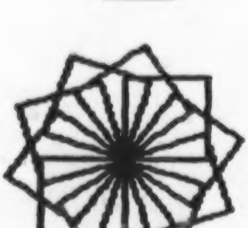


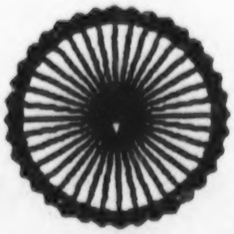


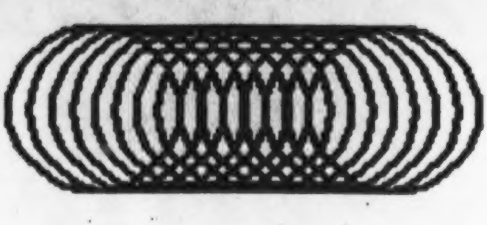


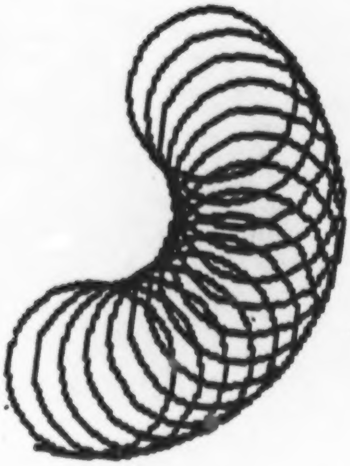


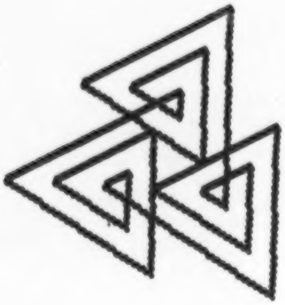


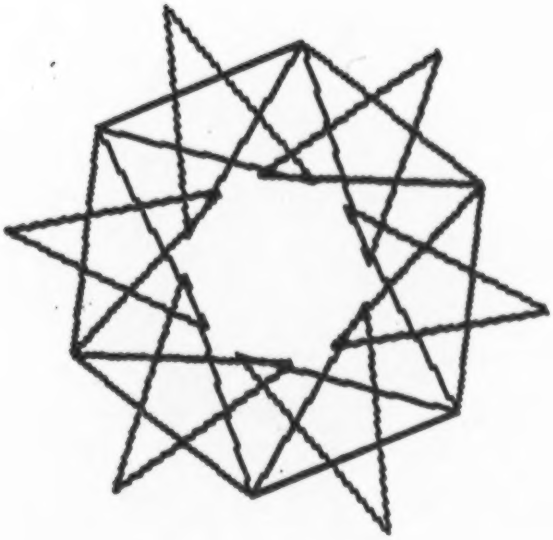


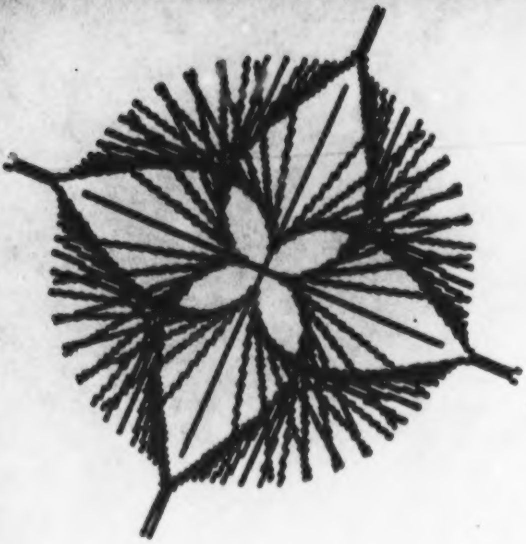


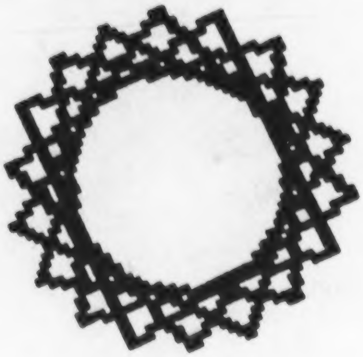


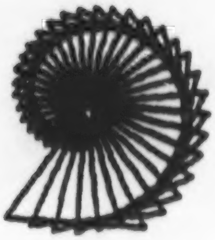


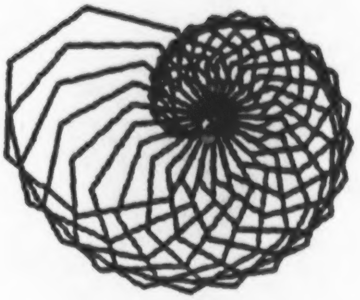


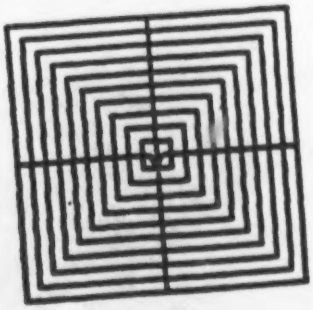


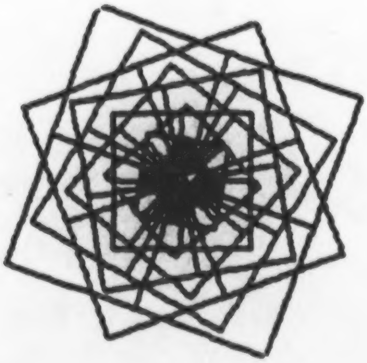






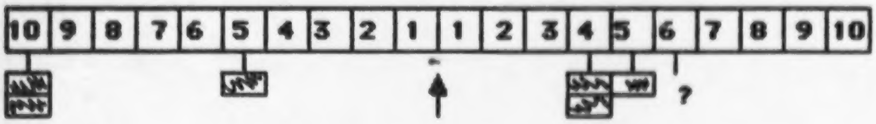
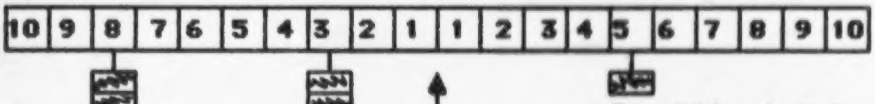
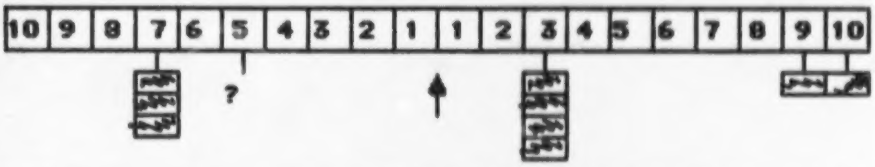
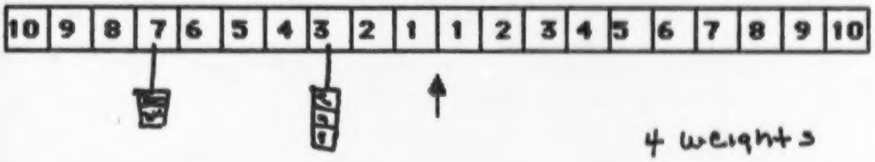
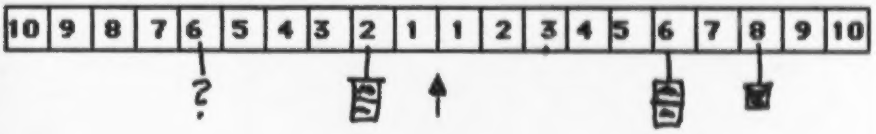
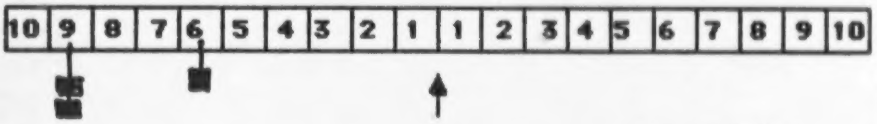
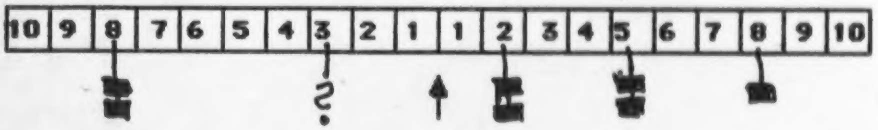






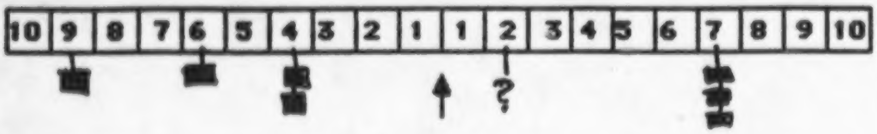
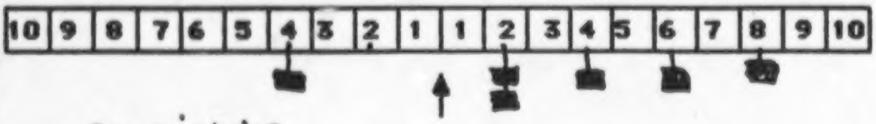
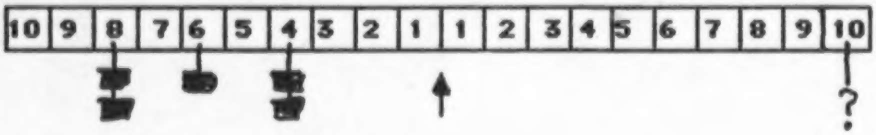
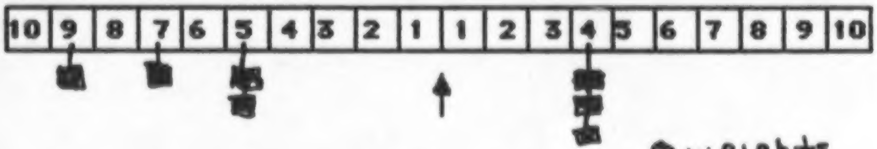
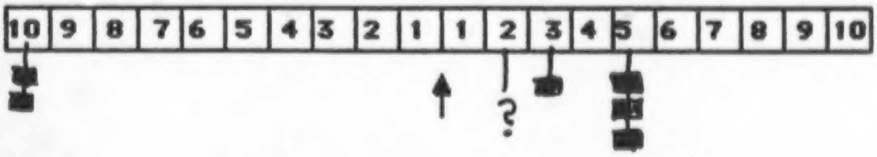
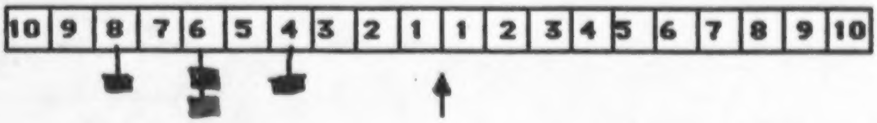
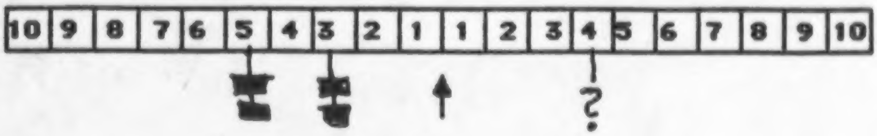
Mathematician: ______________________________

"For each balance beam shown I found the weight needed to balance it or the distance the weights given had to be placed to balance it."

BEAM	WEIGHT NEEDED	NUMBER AT WHICH TO PLACE WEIGHT
	2	
 2 weights where?		7
		
 4 weights		
		
 3 weights		
		

Mathematician: ____________________________________

"For each balance beam shown I found the weight needed to balance it or the distance the weights given had to be placed to balance it."

BEAM	WEIGHT NEEDED	NUMBER AT WHICH TO PLACE WEIGHT
		
 2weights		
		
 2weights		
		
 4 weights		
		

Mathematician:____

"I used a calculator to find AVERAGE and RANGE for the following data sets."

1. The scores on a test given to students in several different schools are given:

Franklin	82
Park	78
Bray	77
Washington	75
Lincoln	73
Bayside	72
Johnson	71
Kennedy	68
Riverside	65

Range ____________________points

Middle ____________________

Average ____________________

Find the range of scores, the middle score, and the average (using the calculator.)

2. Here are the percents of students who are handicapped in several states:

Delaware	16.4
Illinois	13.4
Iowa	11.7
Minnesota	11.5
Nebraska	11.4
Oregon	10.8
South Dakota	10.5
North Dakota	10.1
Wisconsin	9.8
Michigan	9.5
Hawaii	7.6

Range ____________________points

Middle ____________________

Average ____________________

3. The following table gives a typical classification of IQs:

Classification	IQ Score	Percentage of Population
Gifted	140 and over	1
Very Superior	130-139	2.5
Superior	120-129	8
Above Average	110-119	16
Average	90-109	45
Below Average	80-89	16
Borderline	70-79	8
Mild mental retardation	60-60	2.5
Severe mental retardation	59 and below	1

The percentage of population CLASSIFIED as average is:______________

The percentage of population classified above the AVERAGE classification is:______________

The percentage of population classified as RETARDED to some extent is:______________

4. Several states assign lottery income to education in some amount.

State	Gross Sales in 1986 (in millions of dollars)	Net Proceeds in 1986 (in millions of dollars)
California	$ 1,766	$ 693
Illinois	1,316	552
Michigan	999	415
New Hampshire	34	10
New Jersey	990	419
New York	1,317	616
Ohio	943	370

Range in Gross Sales:__________________

Average Gross Sales:__________________

Range in net proceeds: __________________

Average in net proceeds: __________________

5. States require differing numbers of days of school. Some of these are:

Alaska	180 days
Delaware	182 days
Illinois	185 days
Indiana	175 days
Iowa	180 days
Michigan	180 days
Minnesota	170 days
Montana	180 days
No. Dakota	180 days
So. Dakota	175 days
Wisconsin	180 days

Range in days__________

Middle No. of days _____

Most frequent No. of days ______

Average No. of days ______

6. In a recent NBA game, the Celtics box score showed the following:

	Min.	FG-A	FT-A	R	A	FT	TP
Bird	31	8-14	2-2	6	9	1	19
McHale	32	10-16	6-9	9	0	1	26
Parish	28	6-11	6-7	8	1	1	18
D. Johnson	33	6-14	1-1	3	10	1	13
Ainge	29	9-15	0-0	5	6	1	19
Buckner	16	3-5	0-0	4	6	4	6
Williams	14	3-5	0-0	0	5	2	6
Wedman	23	11-11	0-2	5	2	4	26
Maxwell	16	1-1	1-2	3	1	0	3
Kite	10	3-5	1-2	3	0	1	7
Carr	4	1-3	0-0	1	0	1	3
Clark	4	1-2	0-0	1	3	0	2

Complete the Table

	Range	Average	Middle	Most Frequent No.
Minutes played				
Field goals attempted				
Field goals made				
Individual field goals shooting percentage				
Free throws attempted				
Free throws made				
Individual free throw shooting percentage				
Rebounds				
Assists				
Personal Fouls				
Total points scored				

Mathematician:____

"I found the probability estimate fraction for each of the following situations.

SITUATION	PROBABILITY ESTIMATE
A 6 sided cube with numerals 1, 2, 3, 4, 5, 6 on each face is rolled. Probability a 5 will be showing on the top face?	
An octahedron has 8 faces. Numerals 1, 2, 3, 4, 5, 6, 7, 8 are put on the faces. Probability of a 4 showing on the top face when it is rolled?	
2 red marbles and 3 blue marbles are in a bag. Probability of blindly reaching in the bag and getting a red marble?	
If in the case above, you get a blue marble and keep it, what is the probability of getting a blue marble the NEXT time you reach in the bag?	
You flip two coins. Probability that you get TWO HEADS?	
6 blue counters and 4 green counters are in a box. You shake the box and pour out one counter. Probability that it is blue?	

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